

inCider



Apple II / Macintosh

AN IDG
COMMUNICATIONS
PUBLICATION
August 1991

**MILESTONES
2000**

**A Souped-Up
Shareware
Sensation**

USA \$3.95
Canada \$4.95

EDITORS' CHOICE P. 80

CREATING ART & MUSIC

**8 Low-Cost
Paint Programs**

**Carry a Tune
With Your II
or Mac**

REVIEWS

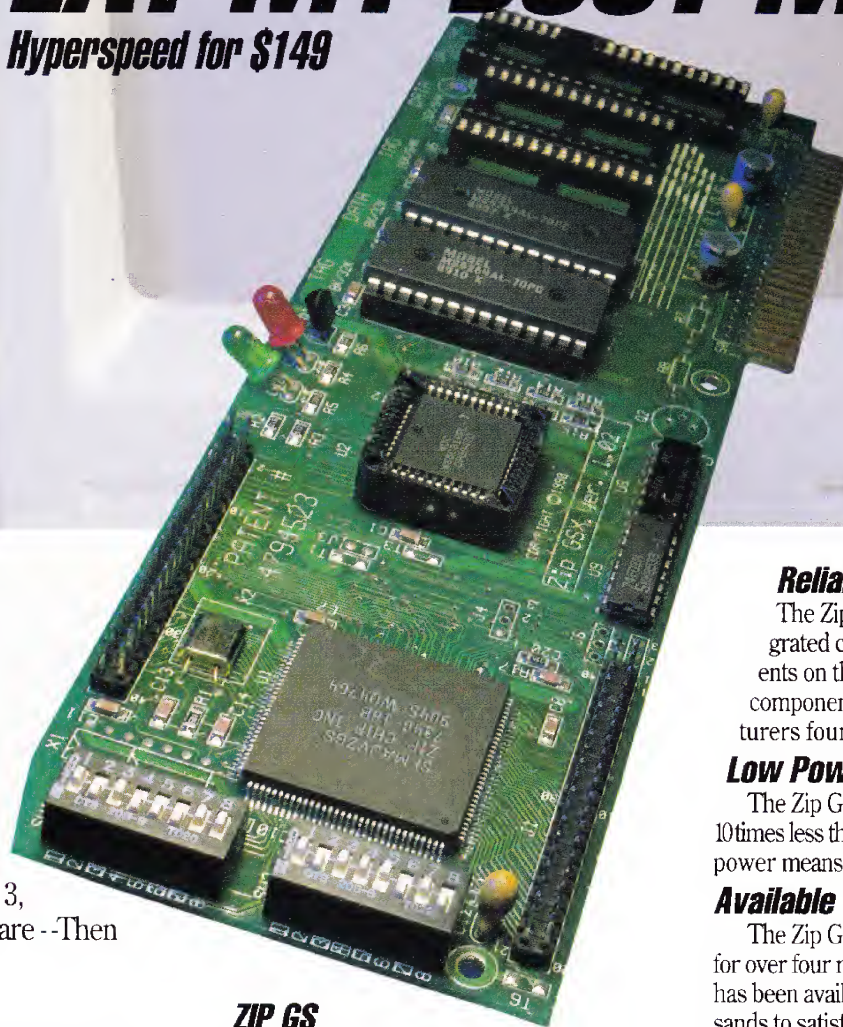
- Design Your Own Railroad
- Super GS Award Maker
- Children's Newspaper Maker



EAT MY DUST Mac...

Hyperspeed for \$149

GS+ Magazine



If You Use...

- Appleworks GS
 - Managing your Money
 - Printshop GS
 - HyperCardGS
 - Springboard Publisher
 - DeluxePaint
 - Quicken • Publish it 3,
- or any other GS software --Then you need a Zip GS.

Here's Why...

To use powerful programs you need a powerful computer. Apple Computer left one thing out of the IIGS when they designed it...speed. The Zip GS puts the speed back in. The Zip GS comes standard with 8 K cache memory and runs at a very speedy 7 Mhz. The Zip GS gives you all the speed you need now and in the future because it's expandable. You will never have to buy another accelerator card again. All upgrades are available now.

Can you imagine the time you will save having your GS running up to 10 Megahertz faster. Appleworks performs like you always thought it should, recalculations in the blink of an eye. Word processing faster than on the new line of Macintosh computers. Nibble magazine said it this way "Apple Computer take note: this chip makes a full featured GS word processor faster than several Macintosh word processors running on a monochrome display." (monochrome display is the fastest) Hallelujah! **ZIP GS DELIVERS!**

ZIP GS

- Is very easy to operate.
- Needs no special boot-up.
- Provides Macintosh speeds for your GS • Is compatible with all GS hardware and software.
- Uses 1/10 the power of competing boards.
- Address all memory.
- Upgradable to 64 K cache memory.
- 16 variable speeds at the touch of a key.
- 30 day money back guarantee and a 1 year warranty.
- Upgradable to 10 megahertz.
- Fully DMA compatible.

Installation

Anyone can install the Zip GS in a matter of minutes. To help with the installation, we include an animated pictorial instruction manual which gives detailed instructions on installation and operation.

Upgradable

The Zip GS can be upgraded at any time. Zip Technology has available upgrade kits that boost the speed to 10Mhz.! We will be happy to do the upgrade labor for free within 48 hours.

Reliable

The Zip GS has only one custom integrated circuit. The other three components on the Zip GS are the same reliable components from the same manufacturers found in your GS Computer.

Low Power

The Zip GS requires only 120 ma of power - 10times less than other accelerators. The low power means it will always run cool.

Available

The Zip GS has been available and shipping for over four months. In the short time that it has been available, we have delivered thousands to satisfied customers around the world.

Special Introductory Offer

The Zip GS is priced at \$199.00 retail. During this introductory offer the Zip GS is only \$149.00, a savings of \$50.00.

ZIP GS Introductory Offer \$149.95

8Mhz upgrade	add only	\$29.95
9Mhz upgrade	add only	\$59.95
8K cache upgrade	add only	\$19.95
32K cache upgrade	add only	\$49.95
Zip GS--10 Ultra Fast 10 Mhz	call	

Risk Free Offer/Money Back Guarantee

If you are not satisfied with the performance of your GS Plus, simply return it in the original box within 30 days for a refund.

Order Today Call Toll Free:

1 800-937-9737

Checks, VISA, Mastercard, American Express and Discovery cards accepted.

Now Shipping
Standard Air By



TECHNOLOGY™ 5601 West Slauson Avenue, Suite #190 • Culver City, CA 90230 • Phone: (213) 337-1313 • FAX: (213) 337-9337

Circle 189 on Reader Service Card.

All product names are trademarks of their manufacturers

Is Your Apple II® ALREADY OBSOLETE?

NO, YOU JUST NEED THE NEW GENERATION OF SOFTWARE!

Feature for feature your Apple II is still one of the best computers ever for home use and the Apple IIGs® is probably THE best computer for home and school ever produced. With a new generation of software your Apple II will carry you well into the 90's; and SOFTDISK PUBLISHING™ is actively developing software for both the Apple II and Apple IIGs. That's why our software subscriptions can be so valuable to you.

WHAT IS SOFTDISK™ FOR THE APPLE II (e, C, C+, +, GS)?

SOFTDISK is a monthly software collection designed for the Apple II. Every month we send you two 5¼" disks or one 800K disk packed with original new programs for your Apple II. What kind of software? Practically anything you can do with an Apple II computer. After 120 issues of SOFTDISK, our editors really know how to provide you with Apple II software you can use.

WHAT IS SOFTDISK G-S™ FOR THE APPLE IIGs?

SOFTDISK G-S is a monthly software collection designed for the Apple IIGs. SOFTDISK G-S is true 16-bit and takes advantage of the special sound and graphics capabilities that only the Apple IIGs supports. Plus, your Apple IIGs is able to run both SOFTDISK and SOFTDISK G-S. And since they have different programs, get both at a special combo price!

QUALITY ORIGINAL SOFTWARE

Don't confuse SOFTDISK and SOFTDISK G-S with shareware or public domain software. Our low price is made possible by our large circulation, not by inferior programs. There are no extra fees to pay for your software or FREE TECHNICAL SUPPORT. The programs on SOFTDISK and SOFTDISK G-S are developed by the world's best program designers.

A PRICE YOU'LL APPRECIATE

SOFTDISK for your Apple II can be delivered to your home monthly, postage paid, for \$6.65 a month or \$19.95 for three months. SOFTDISK G-S for your IIGs is only \$9.97 a month or \$29.95 for three months. If you're a IIGs owner, we'll offer you a special combo price of \$39.95 for three months. Satisfaction guaranteed!

HERE'S WHAT THE EXPERTS ARE WRITING ABOUT SOFTDISK AND SOFTDISK G-S:

"In a world where real bargains are hard to find, SOFTDISK is a very pleasant surprise..."
—Electronic Learning

"Programs, desk accessories, fonts, games, ... SOFTDISK G-S is a great value!"
—InCider A+

"...this is a full-blown software package with beautiful graphics and an extensive help session ... it's an economical way to add interesting software to your library."

—Apple IIGs Buyer's Guide



WE HAVE HUNDREDS OF LETTERS LIKE THIS:

"Dear Softdisk: Your Softdisk G-S is great! I am very impressed, the moving icons, interesting columns, matter-of-fact reviews, up to date system software, spiffy user interface, etc. I will definitely renew when the time comes."

So there you have it. Original software, outstanding quality, and all at a price you can easily afford. Would you subscribe to a disk packed with programs, postage free? If you're not sure, why not take advantage of this special offer and try just 3 issues - no risk - no obligation to continue. As a bonus, we will also send you FREE—200 Print Shop® graphics. If you're not completely satisfied, we'll refund your money. No questions asked.

CALL FREE **1-800-831-2694**

OR FAX THIS COUPON TO
318-221-8870

SOFTDISK
PUBLISHING
monthly software

FREE

YES! Rush my FREE bonus, 200 Print Shop Graphics, and start my three-month trial subscription to Softdisk G-S and/or Softdisk, postage paid. Make check or money order payable to Softdisk Publishing in U.S. funds (LA residents, add 4% state sales tax).

Check one:

- ☐ Softdisk G-S (For the Apple IIGs) \$29.95, Can./Mex. \$34.95, Other For. \$37.95
☐ Softdisk (For the Apple II) \$19.95, Can./Mex. \$24.95, Other For. \$27.95
☐ Combo-Softdisk G-S & Softdisk \$39.95, Can./Mex. \$49.95, Other For. \$55.95

Check Disk Format: ☐ Two 5.25" disks ☐ One 3.5" disk

Name _____

Address _____

City _____ State _____ Zip + 4 _____

Phone # _____

☐ Discover ☐ Visa/MC ☐ AmEx ☐ Payment Enclosed (U.S. funds only).

Card# _____ Exp. Date _____

Signature _____

SOFTDISK PUBLISHING • P.O. Box 30008 • Shreveport, LA 71130-0008
318-221-8718 • 1-800-831-2694

IN081

CONTENTS OF SOFTDISK # 114 *

MOVIE MINDER- Appleworks® database to organize your videotape library.
MONTHLY MYSTERY II- Very fishy program. A neat screen saver.
CATACOMBS- A four-way scrolling double hi-res game.
M.A.L.T.- A label utility to print labels for your disks, videotapes, etc.
PS GRAPHICS- More PRINT SHOP graphics from our staff.
PLUS- Professor Know-it-all, Readers Write, Gaming Forum.

CONTENTS OF SOFTDISK G-S # 13 *

REFLEXION- A puzzle game with clean graphics and fun sounds.
PS VIEWER-IMAGES- Features school images and some cool aliens.
HACK ATTACK LEVEL SET- New levels for Arkanoid™ game.
JUKEBOX- Three incredible new songs. Sit back and listen.
SPORTS CLIP ART- Two pages of detailed sports figure clip art.
FRESHSCRIPT FONT- A great GS font in four point sizes.
SPENCER'S PAGES- A sensational page layout template, "Lantern Light".
G-ESSENCE- A column about the current state of the Apple world.

Softdisk G-S: 768K—One 3.5" drive Required; 1.25 Meg. Two 5.25" drives Recommended. Softdisk: 64K Required; 128K Recommended.
Softdisk and Softdisk G-S are trademarks of Softdisk Publishing, Inc. Macintosh, Apple II, Apple IIGs and AppleWorks are registered trademarks of Apple Computer, Inc.
Print Shop is a registered trademark of Brderbund Software. Arkanoid is a trademark of Taito.

* Available as a back issue.

7J0008

QUALITY COMPUTERS

OVER-NIGHT!

School P.O.s
Welcome!

1-800-443-6697

School P.O.s
Welcome!

Only
Quality Computers
gives you
ENHANCE



Enhance is Quality Computers bi-monthly informative-technical-entertaining newsletter. Enhance gives you the kind of information you need to make your Apple the effective work/educational tool it was designed to be, like product reviews and comparisons, new product announcements, news, and two special sections, Enhancing Education — written by teachers for teachers, and Computer Club Corner — designed to spark interest in User Groups across the country.

Enhance also includes our catalog — full of all the hardware and software you need for your Apple II. Quality Computers catalog includes detailed product descriptions and MONEY-SAVING COUPONS.

Quality Computers has been publishing *Enhance* for over 4 years. It's free to all QC customers, or you can call for your free subscription today!

"... an excellent publication."
Wanda Bullion
SJAUG User Group, Cherry Hill NJ

"I enjoy reading the articles and always learn something new."
Charles S. Saunders
Sokkie, IL

Get your **FREE** subscription
TODAY!
1-800-443-6697

HARD DRIVES

QUALITY COMPUTERS (w/Apple SCSI)

40 MEG. (Conner Drive)	549.95
100 MEG. (Conner Drive)	749.95
200 MEG.	1,295.95
45 MEG. Removable	699.95
Tape Backup	Call
CD ROM	Call
IIc Drive	Call

APPLIED ENGINEERING

20 MEG. Vulcan (Ile, IIGS)	519.95
40 MEG. Vulcan (Ile, IIGS)	649.95
100 MEG. Vulcan (Ile, IIGS)	1,285.95

SCSI INTERFACE CARDS

Apple High-Speed	109.95
RamFAST/SCSI (w/256K RAM)	179.95

MEMORY CARDS

AE RAMWORKS III

256K	139.95
512K	159.95
1 MEG.	199.95
RGB ColorLink Option	99.95

AE RAMFACTOR

256K	169.95
512K	189.95
1 MEG.	229.95

AE 2-RAM ULTRA II

256K	189.95
512K	209.95
1 MEG.	249.95

AE RAM EXPRESS II

256K	149.95
512K	169.95
1 MEG.	209.95

AE 6S-RAM PLUS or ULTRA

1 MEG.	199.95
2 MEG.	259.95
3 MEG.	319.95

AE 6S-RAM III

1 MEG.	159.95
2 MEG.	219.95
4 MEG.	339.95

CHINOOK 4000 GS

1 MEG.	149.95
2 MEG.	209.95
4 MEG.	329.95

CV TECH. 6S MEMORY BOARD

1 MEG.	149.95
2 MEG.	209.95
3 MEG.	269.95
4 MEG.	329.95

MEMORY CHIPS

256K (bank)	19.95
256Kx4 (set of 2)	19.95
1 MEG. (bank)	69.95
1 MEG. SIMMS	59.95
2 MEG. SIMMS	Call
4 MEG. SIMMS	Call
Mac Classic Modules	Call
Zipps	79.95

DISK DRIVES

AE 3.5"	199.95
AE 3.5" High-Density	239.95
AE 5.25"	129.95
AMR 1.4 MEG. 3.5"	199.95
AMR 5.25" Daisy chainable	129.95
Laser 3.5"	149.95
Laser 5.25"	99.95
Laser UDC	49.95
Apple 3.5" (Ile, II+)	309.95
Apple 3.5" (Ile Plus, IIGS)	319.95
Apple Controller	49.95
Apple Unidisk Controller	59.95

PRINTERS

ImageWriter II	459.95
Hewlett-Packard DeskJet 500	579.95
Panasonic 1180	199.95
Panasonic 1191	249.95
Panasonic 1124i	349.95

PRINTER INTERFACE CARDS

AE Parallel Pro	79.95
AE Serial Pro	109.95
Fingerprint GSI	89.95
Fingerprint Plus	89.95
Fingerprint G+ or SS w/cable	59.95
Grappler 9 Pin	84.95
Grappler Plus	79.95
SPECIAL! SuperWriter 924	64.95
SPECIAL! SMT Printech	29.95



MEMORY CHIPS

256K	\$19.95/bank
256Kx4	19.95/set of 2
1 MEG.	69.95/bank
1 MEG. SIMMS	59.95
2 MEG. SIMMS	Call
4 MEG. SIMMS	Call
Mac Classic	Call
Zipps	79.95/bank

ATTENTION PRICE- HUNTERS!

- We'll match any nationally advertised price!
- We have it in stock!
- Our service can't be beat!
- You get it tomorrow!

PRICE MATCH POLICY AT MANAGER'S
DISCRETION

COMPLETE GS SYSTEMS

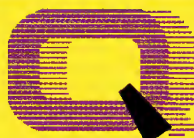


Let us put together an Apple IIGS system to fit your needs. Our knowledgeable sales staff can recommend a system designed for . . .

- the beginner
- extra storage
- extra speed
- the works!

... AT PRICES YOU CAN
LIVE WITH!

Circle 136 on Reader Service Card.



Quality Computers

POWER FOR PERFORMANCE

YOUR COMPLETE APPLE SOURCE

Quality Computers is one of the largest Apple mail order companies in the country. Why? We offer more: a staff of Apple sales experts; a complete product line; user-friendly Customer Service; the best Technical Support in the business; Q Labs, our own software development division; our own newsletter, *Enhance*; and special programs, like the Teacher Bonus Program. No other company offers all this at prices you can live with.

QUALITY COMPUTERS

OVER-NIGHT!

**School P.O.s
Welcome!**

1-800-443-6697

**School P.O.s
Welcome!**



HYPERMEDIA

Your Apple II can become a hypermedia machine! Integrate text, sound, and graphics to

create an interactive tutorial, computerized slide show, and more!

HYPERSTUDIO — Apple IIGS
Requires 1.25 MEG. **\$82.95**

HYPERCARD IIGS
Requires 1.5 MEG. **\$79.95**

TUTOR-TECH — Apple IIe, IIc, IIGS
Requires 128K **\$149.95**

MODEMS

SupraModem 2400	99.95
SupraModem Plus w/MNP5	179.95
SPECIAL! SUPRA BUNDLE	
SupraModem 2400, Cable, and TIC	134.95
AE DataLink 2400 (Internal)	159.95
AE DataLink Express	179.95
AE DataLink Express w/MNP5	219.95
AE DataLink Exp. (MNP5/Send-FAX) GS	219.95

MONITORS

12" Amber or Green Monochrome	99.95
Magnavox RGB	299.95
Custom Cable (GS)	19.95
Apple RGB	459.95

INPUT DEVICES

AppleMouse IIe	119.95
A+ IIGS Mouse	79.95
Laser Mouse (WORKS ON IIc!)	49.95
Kensington Turbo Mouse	109.95
CH Mach III Joystick	29.95
CH Mach IV Plus Joystick	62.95
CH Flightstick	47.95
IBM-Compatible Keyboard	79.95
IIGS/Mac ADB Keyboard	129.95

SOUND & GRAPHICS HARDWARE

Quickie (IIe, IIGS)	199.95
LightningScan GS	199.95
ComputerEyes IIe	99.95
ComputerEyes IIGS	195.95
Apple Video Overlay Card	429.95
AE Sonic Blaster	98.95
AE Audio Animator	179.95
Echo II	109.95

COMPUTERS

Apple IIGS CPU (w/1 MEG. RAM)	799.95
Laser 128EX	387.95
Laser 128 Color System	510.95

ACCESSORIES

AE TransWarp GS	229.95
AE TransWarp GS w/32K cache	319.95
AE TransWarp GS Upgrade	32.95
AE Converter	77.95
AE Power Supply	79.95
AE Power Supply IIGS	89.95
AE TimeMaster	78.95
Apple IIe Enhancement Kit	59.95
Cables (most)	14.95
Extended 80 Column Card (IIe)	24.95
Kensington System Saver IIe	59.95
Kensington System Saver GS	69.95
Numeric Keypad IIe	34.95
NEW! QC POWER SUPPLY IIe	59.95
SMT No Slot Clock	29.95
Switchboxes	from 24.95
Zip GSX 1600	179.95

LASERDISC SOFTWARE

The Presenter	53.95
National Gallery of Art	94.95
Great Quake of '89	44.95
The National Zoo	29.95

HYPERMEDIA

HyperStudio GS	82.95
Lab Pack	449.95
NEW! HyperCard IIGS	79.95
Tutor-Tech (IIe, IIc, IIGS)	149.95

BUSINESS SOFTWARE

AppleWorks 3.0	169.95
10 Pack (3.5" or 5.25")	949.95
Appleshare Network Version	1,089.95
AppleWorks GS	199.95
10 Pack	1,139.95
AppleWorks 3.0 Companion	24.95
BeagleWrite	48.95
BeagleWrite GS	59.95
BusinessWorks Bundle	249.95
BusinessWorks Payroll	99.95
BusinessWorks System Manager	79.95
DB Master Pro	189.95
NEW! InWords (OCR)	79.95
Managing Your Money 5.0	99.95
Quicken	38.95
ReportCard II	42.95
Sensible Grammar	52.95
Sensible Speller	79.95
WordPerfect IIe or IIGS	104.95

COMMUNICATION SOFTWARE

Point to Point	59.95
ProTERM v.2.2	79.95
ProTERM School Pack	279.95
AE ReadyLink	58.95
TIC	39.95

EDUCATIONAL SOFTWARE

Ask about School Editions, Lab Packs and Site Licenses.

ORANGE CHERRY — TALKING SHOOHOUSE	
Talking ABC's GS	38.95
Talking Addition & Subtraction GS	38.95
Talking Animals Activity Set GS	38.95
Talking Classroom GS	38.95
Talking USA Map GS	38.95

THE LEARNING COMPANY

Reader Rabbit or Math Rabbit	24.95
Talking Reader Rabbit GS	34.95
Children's Writing & Publishing Center	34.95
Think Quick	34.95

BRODERBUND

Where in the World is Carmen Sandiego?	25.95
Macintosh Version	29.95
Carmen USA, Europe, Time, or World GS	29.95
Macintosh Version	29.95
The Playroom	24.95
Macintosh Version	29.95
The New Print Shop	29.95
Katie's Farm or McGee	24.95
Macintosh Version	27.95
NEW! McGee at the Fun Fair	24.95
Macintosh Version	27.95
Geometry GS	54.95
Kid Pix	29.95
Science ToolKit - Master Module	54.95
Science ToolKit - Modules 1, or 2	27.95

WEEKLY READER

Sticky Bear Numbers, ABC's,	
Opposites, or Shapes	24.95
Talking Sticky Bear ABC's,	
Opposites, or Shapes	29.95

MECC

Calendar Crafter GS	32.95
Fraction Munchers or Number Munchers	24.95
Oregon Trail	24.95
USA GeoGraph GS	54.95
Word Munchers	24.95
World GeoGraph GS	54.95



INWORDS WESTCODE

With InWords and a hand-held scanner, you can scan virtually any printed information — just as if you typed it from the keyboard — only faster. Enters up to 500 words/minute. Req. Apple IIGS or enhanced IIe w/512K, and Quickie or compatible scanner. **\$79.95**



TALKING TOOLS BYTEWORKS

Now your IIGS can talk back with the new Talking Tools program. Desktop program will read words or documents in male or female voice. Also includes interfaces for Orca programmers to add speech to their programs. **\$39.95**



ORCA/C BUNDLE BYTEWORKS

Learn to program with the Orca/C compiler and the Learn to Program Tutorial. Includes complete C libraries, extension for IIGS Tool Box and built-in debugger. Easy and fun!
Orca/C **\$79.95**
Learn to Program **119.95**

SPECIAL!



SUPRA BUNDLE SPECIAL!

Telecommunications is HOT! Find out why. Get the QC Supra Bundle. It includes the Hayes-compatible SupraModem 2400, cable, and TIC software. Suggested retail price \$230 — you save \$95!

\$134.95



APPLE IIe ENHANCEMENTS

Give your IIe improved capabilities with enhancement products from Apple:

AppleMouse\$119.95
Enhancement Kit 59.95
3.5 Unidisk (not shown)	309.95
Unidisk Controller 59.95

**ASK ABOUT OUR
TEACHER BONUS POINT
PROGRAM!**



Quality Computers

POWER FOR PERFORMANCE

POLICY

- We ship via Airborne Express, UPS, DHL, and US Mail. Saturday deliveries available. If order is split, we pay freight on balance of items. Add \$3.95 for C.O.D. certified.
- RETURNS: All defective or mis-shipped items may be returned within 30 days for replacement. Items returned with damaged or incomplete packaging will be charged packaging fees. No refunds on software items (unless otherwise specified). Ask about our Rental Program!
- Prices subject to change without notice.
- We accept school P.O.'s by mail, phone or FAX (313) 774-2698.

Circle 136 on Reader Service Card.





Quality Computers

SIMPLY THE BEST

As the Apple hard drive leader, we've sold and serviced every hard drive on the market. We've shipped them out, and we've seen them come back - in droves. We've listened to thousands of complaints and processed hundreds of returns.

Finally, those days are over. We are proud to announce a hard drive we trust so much that we put our name on it - the Q Drive.

Why do we trust the Q Drive? Simply, we demanded the best, and we got it:

THE BEST INTERNAL MECHANISM. Other companies sell hard drives with poor quality internal mechanisms to keep their costs down. We didn't settle for that. Ours are fast (25ms), quiet, reliable, and incorporate the latest hard drive technology, including a voice coil actuator for faster head positioning, and track buffering for quick data access.

THE BEST COMPATIBILITY. We demanded SCSI compatibility. With SCSI you get complete compatibility with all present and future Apple products, as well as almost any new system you get, whether it's Apple, Macintosh, or IBM. The Q Drive comes with the Apple High-Speed SCSI card, standard, or the RamFAST/SCSI card on request.

THE BEST DOCUMENTATION. The Q Drive's plain-English manual is the most complete available. It not only covers installation and set up, but also hard drive basics, ProDOS, pathnames, subdirectories, GS/OS, the Finder, backups, maintenance, and troubleshooting. There's even a glossary of hard drive terminology.

EASIEST TO USE. The Q Drive's software makes setting up a breeze. It instantly determines which Apple it's running on and configures the Q Drive appropriately. The latest system software is built-in, along with the Finder or ProDOS 8 Mini-Selector, and 15 MEG of the best public domain software available. The Q Drive even performs diagnostics, and can install EasyDrive for you, automatically.

THE BEST SERVICE AND SUPPORT. The Q Drive is backed by the Quality Computers Technical Support staff - the best in the business. It comes with a hassle-free 30-day money back guarantee, and a 1-year limited warranty. Plus, should your Q Drive ever fail, you can count on 72-hour average service time, and complete data recovery in most cases.

THE BEST PRICE. We priced the Q Drive to make it one of the most affordable hard drives available. Hardware, software, support, and price make the Q Drive the best Apple hard drive value. Take one for a test drive today!



Undecided about a hard drive? Get the Hard Drive Buyer's Guide. It has everything you need to make an informed hard drive purchase, including our exclusive Hard

Drive Demonstration Software, so you can feel the power and speed of a hard drive before you buy one. (Shipped overnight to most locations)



TOP 10 REASONS WHY THE Q DRIVE IS YOUR BEST CHOICE

1. Comes complete with the Apple High Speed SCSI Card or RamFAST/SCSI Card (add \$70).
2. Comes with free 15 MEG library of great public domain software.
3. Comes with the latest system software: GS/OS, ProDOS 8, the Finder, and a Mini-Selector
4. Instantly recognizes your computer (Apple IIe or IIGS) and automatically configures itself.
5. Comes with the most complete documentation in the industry. Not only will you learn how to operate your Q Drive, you'll learn how it and other hard drives work.
6. 100% SCSI compatible so it works on any Apple IIe, IIGS or Macintosh.
7. Backed by the fastest, most comprehensive service plan in the industry.
8. Hassle-free 30-day money back guarantee, and a 1-year limited warranty.
9. The best internal mechanism.
10. Attractive, compact case compliments your system, whether it sits under your monitor, on its side, or anywhere you want it. 9-3/4" x 10" x 2-1/2"

"The Q Drive is fantastic! Super-fast, quiet, formats itself, and a super 15 MEG software base — what a bonus!

Howard J. Dillon
Las Vegas, NV

"... the Q Drive software is so easy to use that it practically sets up the drive itself."
inCider Magazine

No other drive gives you all this at such a low price.

Don't settle for less!

40 MEG \$549.95

100 MEG 749.95

200 MEG. . 1,295.95

ALSO AVAILABLE!

- 45 MEG Removable
- Tape Backup
- IIC Drives
- CD-ROM Drive

VICE PRESIDENT/GROUP PUBLISHER Paul Boulé

EDITOR IN CHIEF Dan Muse
EXECUTIVE EDITOR Eileen T. Terrill
SENIOR EDITOR Paul Statt
ASSOCIATE EDITOR Carla Barker
ASSOCIATE EDITOR Cameron Crotty
SPECIAL PRODUCTS MANAGER Janet Cote
WEST COAST EDITOR Jeff Cable
CONTRIBUTING EDITORS Cynthia Field
Gregg Keizer
Joe Kohn
Ruth K. Witkin

DESIGN

ART DIRECTOR John Sizing
ASSISTANT ART DIRECTOR Dianne K. Risson
PRODUCTION MANAGER/DESIGNER/AD GRAPHICS Elizabeth Auer

ADVERTISING Eastern Sales Office

ASSOCIATE PUBLISHER/NATIONAL SALES MANAGER Dale Strang (800) 441-4403
SALES REPRESENTATIVE Diane Maguire (800) 441-4403
ADVERTISING COORDINATOR Mary Hartwell (800) 441-4403
ADMINISTRATIVE ASSISTANT Lisa Benway-Caron
WESTERN SALES MANAGER James Burns
2421 Broadway
Suite 200
Redwood City, CA 94063
(415) 363-5230

MARKETING SERVICES/PROMOTION

DIRECTOR OF MARKETING Peg Brown
MARKETING ASSISTANT Rita Rivard

CORPORATE PRODUCTION

PRODUCTION DIRECTOR Sue Gross
MACINTOSH COORDINATOR Doreen Means

IDG COMMUNICATIONS/PETERBOROUGH

PRESIDENT Roger Murphy
VICE PRESIDENT Dennis Christensen
MANUFACTURING/OPERATIONS Bonnie Welsh-Carroll
VICE PRESIDENT Jeffrey D. DeTray
CIRCULATION/PLANNING
DIRECTOR OF TECHNOLOGY RESEARCH Linda Ruth (800) 343-0728
SINGLE-COPY SALES DIRECTOR Debbie Walsh
NEWSSTAND PROMOTION MANAGER Megan Lane
CIRCULATION DIRECTOR Laurie K. Seamans
ASSISTANT CIRCULATION MANAGER (800) 289-0619
CUSTOMER SERVICE William M. Boyer
DIRECTOR OF CREDIT, SALES AND COLLECTION
AUDITS AND STATISTICS Cecile Giguere
FOUNDER Wayne Green

inCider/A+ supports a forum on America Online. For information on obtaining appropriate software, call Quantum Computer Services at (800) 227-6345 x5290 or 5291.



inCider/A+ (ISSN #1054-6456) is published monthly by A+ Publishing, a division of IDG Communications, 80 Elm St., Peterborough, NH 03458. Phone: (603) 924-0100. Second-class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second-class mail registration number 9590.) Subscription rates in U.S. are \$27.97 for one year, \$43 for two years and \$59 for three years. Foreign orders must be prepaid in U.S. funds drawn on a U.S. bank. One year only: Canada \$37.97 (price includes GST, #126038406), Mexico \$37.97, foreign surface mail \$47.97, foreign air mail \$82.97. Nationally distributed by International Circulation Distributors. Postmaster: Send address changes to inCider/A+, Subscription Services, P.O. Box 58618, Boulder, CO 80322-8618. (Send Canadian changes of address to inCider/A+, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.)



Quality Computers

20200 Nine Mile Road • Box 665
St. Clair Shores, MI 48080
SALES: 1-800-443-6697

Tech. Support: (313) 774-7740
Cust. Service: (313) 774-7200
FAX: (313) 774-2698

QUALITY COMPUTERS

OVER-NIGHT!

**School P.O.s
Welcome!**

1-800-443-6697

**School P.O.s
Welcome!**



CROSSWORKS SOFTSPOKEN

Copies and converts files either way between Apple II and IBM, and translates the formats. Exchanges AppleWorks files with MicroSoft Works, WordPerfect, Lotus 1-2-3, dBase and other popular MS-DOS programs via universal cable (included) or modem. **\$69.95**



PLATINUM PAINT BEAGLE BROS.

Platinum Paint's graphic editing features are easy-to-use and incredibly fast. Compose paintings, signs or color illustrations, import clip art, colorize scanned images, and more! Whatever your graphic needs are, you can do it with Platinum Paint. **\$59.95**

DAVIDSON

Algebra Plus	29.95
Grammar Gremlins	29.95
MathBlaster Plus	29.95
MathBlaster Mystery	29.95
Read & Roll	34.95
Spell It Plus	32.95
Word Attack Plus	32.95

OTHER TITLES

Crossword Magic	34.95
Mavis Beacon Teaches Typing	27.95
Mavis Beacon Teaches Typing GS	33.95
Evelyn Wood Dynamic Reader	24.95
Creation	29.95

ENTERTAINMENT SOFTWARE

Bard's Tale II GS	18.95
Battle Chess GS	32.95
The Cyllian Mission	44.95
Crystal Quest	32.95
The Duel: Test Drive II	32.95
Grand Prix Circuit	28.95
Hunt for Red October	22.95
Jack Nicklaus Golf	32.95
Tetris	27.95
Tunnels of Armageddon	29.95
Xenocide	32.95

SOUND & GRAPHICS SOFTWARE

8/16 Paint (Ile, IIG, IIGS)	49.95
Award Maker Plus	29.95
Bannermania	24.95
Design Your Own Home GS	59.95
Font Factory GS	25.95
GraphicWriter III	74.95
GS Font Editor	29.95
Labels, Labels, Labels (5.25)	24.95
Platinum Paint	59.95
PrintShop NEW! (3.5 or 5.25)	29.95
PrintShop GS	36.95
PrintShop GS Companion	29.95
PS Graphics Libraries	each 16.95
PS Graphics Libraries GS	each 24.95
PS Lover's Utility Set (Ile or IIGS)	27.95
NEW! Publish It! 4	89.95
VCR Companion	34.95

TIMEOUT SERIES — BEAGLE

DecisionPak	89.95
PerformancePak	69.95
StylePak	79.95
MacroEase	25.95
DeskTools, FileMaster, PowerPack,	
SideSpread, TextTools, or Thesaurus	32.95
QuickSpell, SpreadTools, or UltraMacros	40.95
SuperFonts, SuperForms or Telecomm	42.95
Outliner	42.95
ReportWriter	48.95
Graph	52.95

UTILITIES & LANGUAGES

Amazing Window Grade Sheet	39.95
Bag of Tricks	28.95
Copy II Plus 9.0	25.95
CrossWorks	69.95
GS Desk Accessories	34.95
NEW! Harmonie 2.0	29.95
Independence	24.95
Micol Advanced BASIC Ile	59.95
Micol Advanced BASIC IIGS	89.95
Orca/DesignMaster	39.95
Orca/PASCAL, Orca/M or Orca/C	79.95
Orca Learn to Program	119.95
Q LABS	

RepairWorks or SuperPatch	34.95
RAMUP, EasyDrive, or TIC	39.95
Ruth Witkin's Best New AW Templates	24.95
SALVATION	
Exorciser, Deliverance, or Bakkup	29.95
Renaissance	34.95
Wings	49.95
SPECIAL! Supreme (All 5 modules)	99.95
SuperConvert	19.95

INSTRUCTIONAL MATERIAL

1,001 Things to do w/Apple IIGS	12.95
The Hard Drive Buyer's Guide	6.00
Hands-On AppleWorks 3-Pack	18.95
Teacher Set	29.95
Lab Pack	239.95
Using AppleWorks GS	15.95
AppleWorks Made Easy	15.95
The Official Print Shop Handbook	15.95
Beneath Apple DOS or ProDOS	ea. 14.95

**30-DAY
TRIAL**



EASYDRIVE Q LABS

The complete management system for your hard-disk. Includes a Launcher, Selector, File Maintenance Program, Image Backup/Restore (with compression), Disk Optimizer, Index Program, and an informative guide to ProDOS and GS/OS. **\$39.95**

**30-DAY
TRIAL**



TIC Q LABS

Enjoy a full-featured communication program at a price you can live with. TIC includes a comprehensive macro language, dozens of terminal emulations, file compression, GS/OS compatibility, and more!

"a powerful program ... a best buy." — inCider

\$39.95

Get ENHANCE free!

Enhance is Quality Computers' bi-monthly technical-informative-entertaining newsletter. It is packed with the kind of information you need like technical tips, product reviews, classroom tips, new product announcements, classified ads where you can buy/sell used equipment, dollars-off coupons, and more. Plus, Enhance includes our complete catalog! Join the hundreds of thousands who have enjoyed Enhance for over 4 years. Get your free subscription today!

Name

Address

City State Zip

Phone ()

Clip and mail to: QUALITY COMPUTERS, P.O. Box 665, St. Clair Shores, MI 48080
Or call 1-800-443-6697

**30-DAY
TRIAL**



REPAIRWORKS/SUPERPATCH

"I wish RepairWorks had been around a few years ago when I was writing my very first feature for inCider." — Lefe Low, inCider

"With a rich harvest of more than 100 patches, SuperPatch helps users tap the power of AppleWorks." — inCider

\$34.95/ea.

**OVERSEAS ORDERS
VIA DHL
3 DAY DELIVERY!**

Circle 136 on Reader Service Card.

Member Better Business Bureau

BUSINESS HOURS

SALES: 1-800-966-1508 or 1-800-443-6697 Mon.-Fri. 9AM-8PM Sat. 10AM-4PM (Eastern Time)
TECHNICAL SUPPORT: (313) 774-7740 Mon.-Fri. 10AM-12/1PM-5:30PM (Eastern Time)
CUSTOMER SERVICE: (313) 774-7200 Mon.-Fri. 9AM-5PM (Eastern Time)

20200 E. Nine Mile Road • Box 665 • St. Clair Shores, MI 48080
Orders & P.O.'s by FAX (313) 774-2698



Quality Computers

POWER FOR PERFORMANCE

OPERATION APPLESTORM

Our Aim:

Defending Your Consumer Rights by Providing -

- Lowest Prices
- Best Service
- Best Support

APPLIED ENGINEERING

3.5 Disk Drive (E, C+, GS)	194
Audio Animator (GS)	174
Conserver (GS)	74
DataLink 2400 (Internal)	159
DL Express 2400, MNP/5	189
GS-RAM II, 1 Meg	126
GS-RAM Plus, 1 Meg	194
GS-RAM Ultra, 1 Meg	194
PC Transporter (E, GS)	257
Power Supply (GS)	89
Power Supply (II+, //e)	74
RamWorks III, 1 Meg	194
Transwarp GS (7 MHZ)	247

RAGIN' ROGER'S SUPER SPECIAL

Vulcan 40 Meg (E or GS) 599

AMR

3.5 Disk Controller Card (E)	49
800K 3.5 Drive	179
52Q MB Mini HD	539
100Q MB Mini HD	799
210Q MB Mini HD	1199

APPLE

GS/OS v5.0.4	39
HyperCard GS	84

APRICORN

RamPro GS, 1 Meg	94
------------------	----

ASIA COMMERCIAL

5.25 Drive (/c, GS)	95
---------------------	----

BEAGLE BROS.

Beagle Compiler	44
Companion +	37
Outliner for AW 3.0	41
Platinum Paint (GS)	59
TO Superfonts	41
TO Superforms	41
TO Text Tools	31
TO Ultra Macros	36

CENTRAL POINT

Copy II Plus v9.1	27
-------------------	----

CH PRODUCTS

CH FlightStick	47
CH Mach III Joystick	31

CLARIS

Appleworks GS v1.1	199
Appleworks 3.0	169

CMS

40 MB Ext HD w/o SCSI	399
81 MB Ext HD w/o SCSI	489

CV TECHNOLOGY

GS Memory Board, 1 Meg	149
RamFAST SCSI Controller (E-GS)	177

GLEN BREDON

ProSel 16 w/manual	74
--------------------	----



OPERATION APPLESTORM

Strategy:

To beat the best advertised price in this magazine or Ragin' Roger will send you a check for \$5 U.S.*



Call WEEKLY for the General's Latest Specials! ☆☆☆☆

INSYNC

Proterm v2.2	77
--------------	----

LASER

Laser 128 Color System	499
Laser 128 EX/2 Computer (3.5)	435
Laser 190A Printer	189

PYGRAPHICS

Music Writer (Level 2, E or GS)	199
---------------------------------	-----

ROGER WAGNER

Hyperstudio	81
-------------	----

SENSIBLE

Sensible Grammar	52
------------------	----

SEVEN HILLS

GraphicWriter III (GS)	60
------------------------	----

SUPRA

2400 Modem	99
2400 Plus Modem	174

VITESSE

Quickie Scanner (E, GS)	195
Salvation Supreme	99
<i>(If you own a hard drive, you need this utility. What a Savings!)</i>	

WESTCODE

InWords (OCR Software)	79
------------------------	----

ZIP

GSX (8 MHZ/16K Cache)	199
GSX+ (9 MHZ/32K Cache)	249
Zip Chip 8 MHZ (/e, c)	149



MACINTOSH PRODUCTS

AMR 1.4 MB 3.5 Drive	179
AMR 100Q MB MINI HD	709
AMR 210Q MB MINI HD	1109
Central Point MacTools Deluxe	84
CH Roller Mouse ABD	79
Clariscad v 2.0	629
Clariscad FileMaker Pro	209
Clariscad MacDraw II	279
CMS 40 MB Ext HD	399
CMS 81 MB Ext HD	489
Freesoft	
White Knight (Telecom)	89
Supra 2400 MacPack Modem	159
Supra 2400 Plus MacPak	219

HOW TO ORDER:

Orders only: 1-800-438-2883

FAX: 1-619-274-2440

15% (\$15 min. restocking fee on refunded items only)

Price quotes & technical support:

1-619-274-1253

8am-5pm PST Monday-Friday

Committed to Value Since 1985



Roger Coats

P.O. Box 171466
San Diego, CA 92197

Circle 90 on Reader Service Card.

OUR FINE PRINT:

*Certain limitations apply to \$5 offer:

1. Advertised price must be published in this magazine.
 2. We reserve the right to question misprints.
 3. Limited to items we carry & stock on hand, excluding games.
 4. Management reserves the right to make final decision.
- We accept the following methods of payment:
- School Purchase Order • VISA & MasterCard
 - Bank Wires • Certified Checks • Money Orders • NO C.O.D.s
 - Sorry, No Software Refunds
 - Not responsible for product compatibility
 - Sorry, no shipping, handling, or insurance returns
 - FOB San Diego • We really appreciate your business!

ARTICLES

32 The Electronic Palette

Let your visual imagination run wild — a good paint package and a graphics-smart computer like the Apple IIGs or the Macintosh LC can put the fun back into creating. With pixels as your medium and the mouse as your tool, Mac and GS programs help you discover the artist within.

40 Command Performance

Listen to what music lovers are doing with Apple IIs, IIGses, and Macs as their instruments. Want to sing like a Baptist choir, swing from country to rock as quick as the Kentucky Headhunters, or soar in symphonic power like the Boston Pops? For teaching, performance, and composition, in classrooms, concert halls, and studios, Apple IIs and Macs deliver a powerful sound.

44 The MIDI Beat

How does one person play *A Bicycle Built for Two* in three-quarter time on four instruments? Through the magic of MIDI, of course. Whether you're a performing musician, a composer, or someone who just likes to tweak notes in your basement, you can plug in your synthesizer and let your Apple pump up the volume. All together now . . .

p. 32

COLUMNS

inCider's View * Dan Muse
Systematic Gamble: Apple Rolls a 7.0.....8

Status Report * Paul Statt
The Architecture of Software Piracy.....16

Bridging the Gap * Gregg Keizer
Long Live 7.024

AppleWorks in Action * Ruth Within
Ye Old Tax Tracker.....50

Press Room * Cynthia E. Field
Desktop-Publishing Star Search.....56

Applesoft Adviser * Dan Bishop
Bit-Map Attack60

Learning Curve * David D. Thornburg
A Revolution in Computer Literacy72

DEPARTMENTS

Letters to the Editor.....10

What's New
News, New-Product Focus,
Notes from the APA.....12

Apple Clinic
Backing Out Gracefully:
Double Reverse, Vulcan
Logic, Is It Full or Not?
Laser UDC, Apple-
Works Clinic.....20

Reviews
Design Your Own
Railroad, Tesserae,
Children's Newspaper
Maker, Super GS Award Maker.....30

Hints
Words to the Wise.....70

Editors' Choice
Milestones 2000.....80



p. 12



Downloaded from www.Apple2Online.com

SYSTEMATIC GAMBLE: APPLE ROLLS A 7.0

Apple's upping the OS ante — System 7 will change the way computer users judge integration.

When the Macintosh was first introduced in 1984, I was doing the majority of my work as managing editor of *Microcomputing* magazine on an MS-DOS computer running WordStar and 1-2-3. When our two just-released 128K Macs arrived, however, I quickly snagged one for my desk. It was obvious even then that the Mac had a lot going for it. With its desktop, or Finder — or whatever you choose to call that unique look and feel — the Macintosh was simply different and,



By DAN MUSE * EDITOR IN CHIEF

to many, better. The only question back then was whether or not the Mac would generate the same software-development effort the Apple II did. It did, but it didn't happen overnight. Early users spent a lot of time waiting for their computer and waiting for software. The Mac eventually gained momentum, though, and pointing and clicking became a way of life.

Over the years other systems have emulated the Mac successfully. No one does it as well, but just about every computer from the Commodore 64 to DEC's MicroVax takes advantage of mice, overlapping windows, and fonts these days. Most recently,

Microsoft's Windows has been nipping at Apple's GUI (graphical user interface) heels. It doesn't turn an MS-DOS clone into a Mac, but, as the expression goes, it's close enough for government work. When Windows 3.0 hit the streets last May, it was clear that Apple needed to up the ante, and it has. System 7, Apple's new operating system, is an ingenious accomplishment that puts some distance between the Mac and the competition.

Does that mean you should rush out and plunk down your \$99 for an upgrade kit? Maybe not just yet. The price of entry to 7.0 isn't steep, but it's there. I've installed System 7 on an SE/30 with 5 megabytes of RAM and haven't noticed any major performance degradation. Paul Statt, however, running the new operating system on his LC with the 7.0 minimum of 2 megs of RAM, reacted with language I don't dare repeat here. (Well, it may be slow, but System 7 sure looks nice on his color LC.) If you upgrade, plan on at least 2.5 megabytes of RAM.

In addition, some of 7.0's features won't be available immediately. The premise and the promise of System 7 center around sharing files and information among applications and among users. These highly touted features — "publish and subscribe," "interapplication communication," and "Apple events" — take cut and paste a big step further. If you want to share your drawing of a dog with other dog lovers, for instance, you can select the graphic and then publish an "edition" containing it. If anyone is interested, he or she can "subscribe" to it. But applications will have to be revised to implement this level of communications.

Educators, however, may not want to wait. System 7's peer-to-peer networking capabilities will be tempting for anyone running AppleShare. With 7.0, you can reclaim that Mac you've been using as a dedicated file server; now any Mac on the network can share files with other Macs.

System 7 will change the way computer users judge integration. If you want to move forward with your Mac, it's inevitable that you'll upgrade. Even if you don't want to share anything, there are other 7.0 temptations: on-line balloon help, easier font and desk-accessory installation, a more flexible find-file feature, and more.

Unless you're on a network, however, our advice is to move slowly. In fact, you may want to wait for 7.0 to become 7.1. Why? It's fun now to reminisce about those first Macs, but I'm sure the people who bought them didn't enjoy their expensive pioneer experience. The potential's great, but we expect that 7.0 will experience the same sluggish first year the original Mac did. □



USA/CANADA TOLL FREE
800-624-2926

IN ILLINOIS
708-888-8300



YOUR SINGLE SOURCE SUPPLIER FOR COMPUTER SOFTWARE ■ DISKETTES ■ ACCESSORIES

A+ in SAVINGS!

Save up to 60% Everyday!

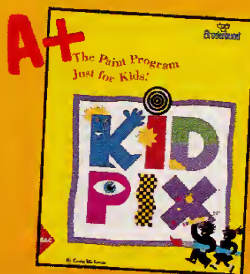
Call Now for
Your FREE
Fall & Mac
Catalogs!



WEATHER WIZARDS
\$59⁹⁹
APL/IIGs/IBM
LAB PACK \$95.99



ESL COMPANION
\$79⁹⁹
APL/IBM



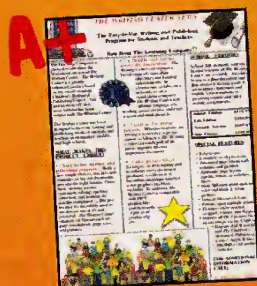
KID PIX
\$29⁹⁹
MAC
School Version \$44.95



COLOR MACCHEESE
\$56⁹⁹
MAC



DESERT STORM
\$34⁹⁹
CD-ROM



THE WRITING CENTER
\$86⁹⁹
MAC
Lab Pack \$249.99



NEW MATH BLASTER PLUS
\$41⁹⁹
MAC
School Version \$48.99
Lab Pack \$144.99
\$32.99 APL/IIGs/IBM

CD-ROM/LASERDISCS

Vietnam Remembered	CD	79.95
CD Fun House	CD	42.95
Scary Poems for Rotten Kids	CD	69.95
Cosmic Osmo	CD	59.95
Grolier Electronic Encyclopedia ..	CD	274.95
Bio Sci II	LD	492.95
Aids	LD	493.95
Pioneer LaserDisc LD-V2200 Player		699.95
NEC Intersect CDR-36 CD-ROM Player		475.00

THE COMBO PACK

To Enhance the Children's
Writing & Publishing Center

Includes All Three
Graphics Disks:

**NATURE
HOLIDAY
PEOPLE & PLACES**

\$49⁹⁹ APL/IIGs
School Version \$59.99

350 Color
Graphics!



DISKS/PAPER

Multiples of 50

Disks - 5.25" DS/DD .. \$.35
Disks - 3.5" DS/DD69

10 Pack Assortment

Color Disks - 5.25" 6.95
Color Disks - 3.5" 14.50

250 Sheet Assortment

Color Paper 10.95

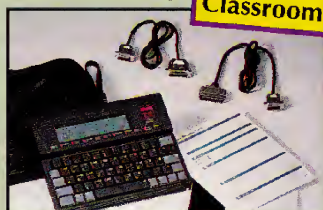
LASER PC4 PORTABLE COMPUTER

Download files to your IBM/MAC.

Includes MacLink™ or PC Tools™ Desktop.

- Spell checker
- Word processor
- Spreadsheet
- Phone directory
- Auto phone dialer
- Appointment book
- Expense module
- Alarm clock
- Less than 2 pounds

\$239⁹⁹ MAC



\$209⁹⁹ IBM

Great for
Home &
Classroom!

LOWEST RIBBON PRICES

ImageWriter I & II*	\$ 2.50
ImageWriter II 4-color	4.95
ImageWriter II 4-color Heat Trans	14.95
Panasonic KX-P 1090, 1091, 1092*	3.25
Epson MX/FX/RX 70, 80*	2.50
Epson LX 80/90*	2.50
Epson MX 100	4.00
IBM ProPrinter	4.75
Okidata 182/192/193	2.99

* For quantities less than 6 or for colors - add \$1.00 each

EXTRAS

ComputerEyes, Color IIGs	\$ 194.95
PC Viewer 480S	895.95
PC Viewer (New Color)	1895.95
Vulcan 40 meg Hard Drive APL/IIGs ..	649.95
Quickie Hand Scanner APL/IIGs	194.95
InWords (for use w/ Quickie)	79.95
IEasy RAM 64K Memory Upgrade ...	18.95
Laser 128 Color System	499.95
Laser 128 Monochrome Monitor	349.95

TERMS Prices effective thru October 31, 1991

- Checks & School P.O.'s welcome
- Free shipping over \$300 in U.S.
- Under \$300 add 5% shipping w/ \$4.00 min.
- \$25 min. on charge cards
- Canada under \$500 add 10% w/ \$5 min.
- over \$500, add 5%. Also add 7% GST



M a i l EDUCATIONAL RESOURCES
School 1550 Executive Drive
PO's to: Elgin, Illinois 60123



LETTERS



LEGALLY BLIND

I READ WITH GREAT INTEREST Dr. Bruce Williams' letter in the May issue. (See "Family Computing," p.14.) As legally blind IIGS users, my wife and I have experienced numerous frustrations.

The biggest problem is the lack of information provided by Apple on modifying or otherwise working around the Finder — the pointer is too small, the desktop background color provides insufficient contrast with the windows, and the list goes on. As novice users, we don't understand ProDOS intuitively and our GS documentation told us nothing about launching programs from outside the Finder. Nor do we know how to adapt AppleWorks for speech, although we own both Echo+ and Slotbuster speech synthesizer cards.

Our quest has taken us through numerous telephone calls to Apple's customer service/special needs center (only marginally helpful) and placed us in contact with "Closing the Gap," a special project concerned with adapting technology for handicapped users. Getting information on adapting the IIGS

to make it useful "out of the box" seems much harder than it should. Even Apple was unable to give us any useful information.

I'd like to hear from other challenged Apple IIGS users, especially those who are visually impaired. You may respond via cassette, Braille, or inkprint. Anyone who can tell me how I can make AppleWorks accessible to my wife via speech synthesis, or how to launch programs without the Finder, please contact me soon. Let's communicate!

Paul Shallbetter
604 Southwest First Street
Faribault, MN 55021-5806

The PACER Computer Resource Center is a nonprofit organization specializing in providing alternatives for handicapped users of all hardware platforms. Contact them at 4826 Chicago Ave. South, Minneapolis, MN 55417, (612) 827-2966. Direct your inquiries to Judy Simon, computer-resource coordinator. — eds.

NO REGRETS

GREGG KEIZER'S COMPARISON of the of the Macintosh LC and the Apple IIGS was interesting, but we object to Mr. Keizer's comment that IIGS owners who buy a Q-Drive will "regret it later." (See "Side By Side, Head To Head," June 1991, p. 22.) We've shipped thousands of Q-Drives since their introduction last fall, and they've proven to be the most reliable hard drives we've ever sold. Few Q-Drive owners "regret" their purchases.

Mr. Keizer's contention that the Q-Drive eats up a lot of desk space is ridiculous. It fits snugly between the IIGS and a monitor, or you can stand the drive on its side beside the IIGS. But that's not the point. Desk space is usually the least important concern for hard-drive shoppers. Don't overlook the Q-Drive's many advantages over internal drives. Because the Q-Drive

is a SCSI hard drive, it can move with you to a Mac or a PC. You can also connect additional SCSI devices without using up slots, and you can speed up your SCSI chain with the RamFast/SCSI card — an option that isn't available to internal drives.

I can't imagine why anyone would pay more for a drive that offers none of these features. For the difference in price between the Q-Drive and a comparable internal drive, you could buy the RamFast/SCSI card. Why pay more just to keep the hard drive off your desk? If your desk is like mine, a little less clutter won't make a visible difference anyway.

Actually, the following quote sums it all up nicely: "An internal hard-disk drive costs more than an external one, runs more slowly, turns up the heat in your Apple IIGS or IIE and probably won't work in the next computer you buy. So why buy one?" If that looks familiar, it should — it's from the December 1990 issue of *inCider/A+*! We couldn't agree more.

Joseph P. Gleason
President, Quality Computers
20200 E. Nine Mile Road
St. Clair Shores, MI 48080

As journalists, we should be used to seeing statements taken out of context. The quote Mr. Gleason refers to is from the "Apple II Holiday Shopping Guide," (December 1990, p. 57). We go on to answer our rhetorical question by recommending the Applied Engineering Vulcan internal hard drive.

We have nothing against the Q-Drive and didn't intend to single it out as a product someone would regret purchasing. We mentioned it only as an example of an affordable external hard drive. The point we were making is that no one should overlook the many advantages of desk space. Users suffering from "peripheral overload" giggle uncontrollably at the thought of having a space to maneuver their mouse or operate a hand-held scanner. — eds.

CAUTIONARY TALES

ON RECEIVING YOUR MARCH ISSUE I noted the advertisement for Zip Chips from Computer Enhancers and sent them a check with my order. Although the company cashed the check, I haven't received anything. Computer Enhancers hasn't answered a follow-up letter, nor has a representative answered its phone. Can inCider/A+ exert any influence on the company to get it to act responsibly?

David Herbert
2009 Klamath River Drive
Rancho Cordova, CA 95670

David, your letter is one of many we've received concerning Computer Enhancers. We tried to contact them several times, both by phone and by mail, with no success. At press time, however, we received a letter from Bruce MacIntyre of Computer Enhancers, which included the following statement: "Computer Enhancers regrets its present circumstances and inconvenience to its customers and will right the situation just as fast as possible." — eds.

GEOCENTRIC

DONT GET ME WRONG. APPLEWORKS is fine, but GEOS (graphic-environment operating system) should be more popular. I enjoy having Mac-like windows on my Apple IIe, the endless features, the ease of use, and, when loaded into my 512K RamWorks III, the speed. When you consider geoPaint and geoPublish, not to mention the many desk accessories available, GEOS is more powerful than AppleWorks. And, with Berkeley Softworks' Creativity Disks, I have over 40 fonts from which to choose.

When I bought GEOS, I subscribed to geoWorld magazine, which was great for those owning Commodores. Is there an Apple GEOS user group out there?

Geoff Malta
5263 Deborah Drive
Piscataway, NJ 08854

inCider/A+ WELCOMES READERS' COMMENTS. WE RESERVE THE RIGHT TO EDIT LETTERS FOR CLARITY, STYLE AND SPACE. PLEASE ADDRESS YOUR CORRESPONDENCE TO LETTERS, inCider/A+, 80 ELM STREET, PETERBOROUGH, NH 03458.

LOWEST PRICES ANYWHERE!

BEST SERVICE ! NO HIDDEN COSTS!

UNIV & SCHOOL P.O.'S WELCOME!

APPLE IIGS UPGRADES

4 MEGabyte IIGS RAM board.	
Fully DMA Compatiblew/1 MEG	\$99
Expands ROM 01 & ROM 3 IIGsw/2 MEG	\$149
Fall Specialw/4 MEG	\$229
AEGS-RAM+ 6 MEG RAM board w/1 MEG	\$189
256K RAM SET (8pc) Lifetime Wty	\$18
256K RAM 3 Set Special (24pc)	\$49
1 MEG RAM Set (8pc) 5 Yr Wty	\$55
IIGS Serial/Parallel Converter	\$59
IIGS replacement Power Supply	\$75
SoundSystem 2 New 2-Way Amplified Speaker Pair. Put the S in your IIGS	\$89

IIGS 105 MEG PRO-DRIVE

The fastest Quantum HardDrive (10ms). Complete w/Apple Hi-Speed SCSI Card. BONUS 25 Megabytes of the Best IIGS Public-Domain & Shareware Programs. **PLUG AND PLAY READY!**..... \$699

IIe IIc MEGABYTE RAM

Licensed by Applied Engineering. A 100% replacement for Extended 80 card. Expands Appleworks desktop to 998K and allows instant switching between modules.	
Above w/256K	\$89
Above w/512K	\$109
Super Expander C Expands IIc to 1152K, Appleworks desktop to 1052K, & allows instant module switching w/256K	\$99
Above w/512K	\$119

QUIET COOLING FANS

SuperFan II for II+/IIe. Kensington Style w/surge protect & twin rear AC outlets.....	\$27
Super Cooler GS for your IIGs. No audio line interference. Internal Mount.....	\$24

PRO-KEYPAD for IIe IIc

Numeric data entry made simple. Includes mathematic, decimal & RETURN keys.	
PRO KEYPAD for U.S. & European IIe.....	\$34
PRO KEYPAD for U.S. & European IIc.....	\$39

APPLE II Plus OWNERS

Run Appleworks on your II+ or Franklin Ace! NEW Plusworks III will configure any version of Appleworks to run on your computer. One time configure package. Not a pre-boot.	
A.W. 1.0-2.1 req. 64K, 80 columns, shift key mod.	
A.W. 3.0 req. 128K, 80 columns, shift key mod.	
Plusworks III w/complete docs	\$39
16K RAM BD. Expands II+ from 48K to 64K	\$34
128K RAM BD. Legend/Titan Compatible...	\$64
DOS/ProDOS Emulator for above 128K BD..	\$24
80 Column II+ Board Videx compatible.....	\$48
Shift Key Modification	\$7
Lower Case Adapter. Rev. 7 & up	\$12

FALL SPECIALS

PBC EXTENDED 80 COLUMN CARD for Apple IIe. Expands IIe to 128K (Appleworks desktop to 56K). Super sharp 80 column display, soft switch select 40/80 columns, & Double Hi-res graphics, all built-in!.....	\$35
PBC 256K/80 COLUMN BORD IIe. All above features, plus expands your Appleworks 3.0 desktop to 137KINTRO	\$79
Super Serial Board 100% replacement for Apple Super Serial Card, this versatile RS232 board can be used for all modems and serial printers. For II+/IIe/IIGs.....	\$48
SSB to Imagewriter I cable 10'	\$11
SSB to Imagewriter II cable 10'	\$11
SSB to Modem (Standard RS232) 10'	\$11

MORE SUPER SPECIALS!

Graphic Parallel Board w/6ft cable. Text & graphic screen prints. Versatile graphics including inverse/normal, enhanced, 90 degree rotate & double size print. II+/e/gs..	\$44
Parallel Printer Board w/cable. Text print only. Used where graphics is not required..	\$35
Z80 CP/M Board Opens the CP/M world for II+/e/gs. Microsoft & Turbo Pascal Comp.....	\$34
Joystick III Similar to the Hayes Mach III, with large fire button on stick.....	\$24
6 AMP Power Supply. Drop in replacement for II+/IIe supply. Double the amp power!...	\$49
TV Modulator Connects your Apple II+/IIe to any color or black/white TV.....	\$15
Serial/Parallel Converter. Connects your IIc to any parallel printer.....	\$49
AE Transwarp 3.6Mhz accelerator. II+/e... ..	\$99
ZIPCHIP 8Mhz by Zip Tech. IIe/IIc.....	\$159

DISK DRIVES!

Disk Drive H/H for Apple II+/IIe.....	\$119
Disk Drive H/H for Apple IIc/IIc+/IIGs.....	\$119
Disk Drive H/H Dsy Chainable IIc+/IIGs.....	\$139
Disk Controller BD 5.25" II+/IIe/IIGs	\$34
AMR 3.5" Drive	\$194
A.E. 3.5" Drive	\$199
Disk Controller BD 3.5" II+/IIe	\$49
AE VULCAN HARD DRIVES	Call
CMS20MEG EXT. W/SCSI CARD	\$399

GAMEPORT SWITCHBOX

Switch between mouse & joystick or any two gameport peripherals. Free master cable...	\$29
---	------

COPY II PLUS

The ultimate copy program. For 5.25"-3.5"-Hard drives.	
8.4 w/5 1/4 diskette.....	\$15

SWITCHBOXES!

Connect 2/4 Computers to One Printer!	
Parallel (A/B) 2-Way	\$25
Parallel (A/B/C/D) 4 Way	\$35
Serial (A/B) 2 Way	\$25
Serial (A/B/C/D) 4 Way	\$35
Mini-Din 8 w/Master Cbl (A/B) 2-Way	\$35
Mini-Din 8 w/Master Cbl (A/B/C/D)	\$45

We carry a full line of cables for the Apple II and Mac series!..... Call!

5 YEAR NO HASSLE WARRANTY ON ALL PC BOARDS!

CALL or WRITE FOR OUR COMPLETE PRICE LIST!

ADD \$4 SHIP-C.O.D. OKAY-VISA/MC NO EXTRA FEE!



PRICE BUSTERS (619) 589-0081

4233 Spring St., Ste. 402, La Mesa, CA 92041
Monday-Friday 10 a.m.-5 p.m. Pacific Time

WHAT'S NEW

MS-DOS APPLEWORKS

We've taken some heat for writing about Mac products — so what would you say to an “MS-DOS clone” of AppleWorks 3.0? Remarkable

Technologies' SuperWorks (\$199), has caused more than one double-take around here. SuperWorks functions like AppleWorks on any IBM PC/XT/AT/PS or compatible with 256K of memory (512K recommended) and a disk drive — except that it's faster and the alternate (Alt) key does the job of the open-apple key. It also looks great on a color monitor. You can even change the colors of underlined or boldface text, for instance.

If you use AppleWorks and can train your fingers to find their way around an MS-DOS keyboard, you can use SuperWorks. It even incorporates some features for which AppleWorks users pay extra, such as a macro programming language, telecommunications, a visible clipboard, seamless cut and paste between files, and the ability to hold as many as 126 files on the desktop at any one time. The SuperWorks spreadsheet not only imports Lotus 1-2-3 (as well as AppleWorks) files, it also uses Lotus' unique “3-D” spreadsheet model to let you combine data from many files.

If you have years of AppleWorks experience (but less money than loyalty invested in Apple) and you want to make that next computer an MS-DOS — SuperWorks is for you. You could even type in one of Ruth Witkin's templates. For more information contact Remarkable Technologies at 245 Pegasus Avenue, Northvale, NJ 07647, (201) 784-0900, or circle 351 on the Reader Service card. — P.S.

A CREATIVE CHALLENGE

For the physically challenged and developmentally disabled, a personal computer can make the difference. That is, the difference between busy work and productive careers; the difference between hiring someone to read books aloud and reading for pleasure themselves; the difference between watching basketball games on TV and playing them on the computer; the difference between being victims of circumstance and taking charge of life.



But the technology that really makes a difference in people's lives isn't always listed in the catalog of the company that makes the computer. That's why Johns Hopkins University is sponsoring a search for ideas in “Personal Computing to Assist Persons with Disabilities” this year.

A similar search, conducted by Johns Hopkins ten years ago, highlighted the Apple Adaptive Firmware Card for the Apple II. (It was one of over eight thousand entries.) This card has made possible hundreds of software solutions for physically challenged and developmentally disabled persons, because it lets them use

off-the-shelf software. Johns Hopkins also spotlighted a Braille word processor, an ultrasonic head control for wheelchairs, and an eye-tracking system that lets a person manipulate a computer using his or her eyes only.

Paul Hazan, project director, expects that this year's search will affect even more people: “In 1981 there were fewer than a quarter of a million personal computers in the hands of Americans. Today there are about 20 million — almost a hundredfold increase — with a commensurate increase in the number of creative people who are computer literate.”

Hazan also notes that “the equipment is much more capable,” but don't worry about yours — it makes no difference if you're using an Apple II Plus or a Mac IIx. Your entry can be hardware or software, and the competition is open to computer professionals, students, and amateurs. Entries will be recognized in four areas: employment, independent living, education, and leisure. Regional fairs across the country will display winning entries on the way to the national fair and awards ceremony at the Smithsonian Institution in Washington, DC, on February 1 and 2, 1992.

The grand prize is \$10,000, and more than 100 other prizes will be given for the best ideas, systems, devices, and computer programs. But more important than the prize money is the goal of making the public aware of challenges some people face, and the creative, innovative ways they meet them.

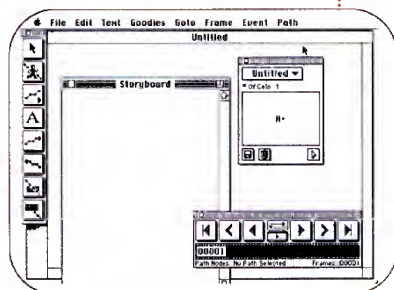
The deadline for the competition is August 23, 1991. Anyone who wants to enter should request an entry flier by writing to Computing to Assist Persons with Disabilities (CAPD), P.O. Box 1200, Laurel, MD 20723. — P.S.

NEW SOFTWARE

Animation Works

It used to cost a fortune and take weeks of training to create animated moving pictures on the Macintosh, but with **Animation Works** (\$199.95) Gold Disk has dropped the price for schools and straightened the learning curve. The **Animation Works Education Lab Pack** costs only \$475, and you can use it with as many as five Macintoshes.

Animation Works consists of a Cel Editor for creating animated characters called cels, a Background Editor for drawing relatively static scenery, and a Movie Editor that combines cels and backgrounds. Teachers will be able



to animate every kind of lesson, from plant growth to sentence building, from the physics of space flight to the interior of the atom.

Animation Works imports Macintosh-standard audio files (MacRecorder and SND) and graphics files (PICS and PICT), and can be used with HyperCard, as well. Animation Works movies can run on anybody's Macintosh, even if he or she doesn't have Animation Works.

For more information contact Gold Disk at 20675 South Western Avenue, Suite 120, Torrance, CA 90501,

(213) 320-5080 (in Canada reach the company at 5155 Spectrum Way, Unit 5, Mississauga, Ontario L4W 5A1, 416-602-4000), or circle 353 on the Reader Service card.

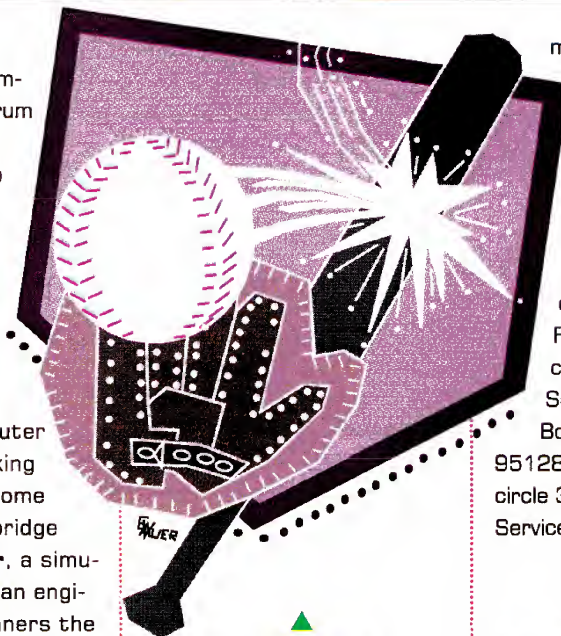
Bridge Builder

Bored with computer games and seeking new ways to have some fun? Try building a bridge with **Bridge Builder**, a simulation developed by an engineer to teach beginners the gentle and difficult art of connecting two riverbanks with a road.

Playing with Bridge Builder is fun, but you learn some pretty serious engineering topics such as force, stability, efficiency, and strength as you tie steel girders and joints into a simulated bridge. To test your bridge, you drive a simulated 80,000-pound truck across it. Will it crash?

Bridge Builder gives students and anybody else a harmless playground where they can experiment with engineering. This "trial and error" approach with simulation is the way engineers work, and Bridge Builder offers a fascinating introduction to this field.

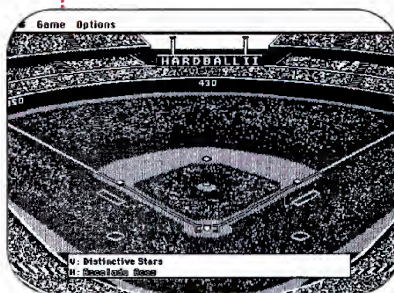
Bridge Builder costs only \$36 from Pre-Engineering Software, 1266 Kimbro Drive, Baton Rouge, LA 70808, (504) 769-3728. For more information contact the company or circle 354 on the Reader Service card.



Playin' HardBall II

Following on the heels of HardBall is Accolade's **HardBall II** (\$54.95) for the Mac. It's as easy to play as the original — it uses the same interface as the Apple II and IIGs versions — but stars improved animation.

HardBall II also includes more major-league ballparks — a total of seven — which make playing an entire season much more fun. Perhaps in response to the Rotisserie League fad, Accolade now lets you store



more player statistics on disk. If reliving moments of glory in statistics bores you, you can replay them with HardBall II's TV Instant Replay. Another major-league improvement is the ability to shift the positions of your fielders for each batter.

All in all, HardBall II is just

more true to life — or to television, if that's how you take your sports. It requires a Mac with 1 megabyte, supports color on the LC and II series (needs 2 megabytes) and uses off-disk copy protection. For more information contact Accolade at 550 South Winchester Boulevard, San José, CA 95128, (408) 985-1700, or circle 352 on the Reader Service card.

Cosmic Wizardry

Wizardry: Bane of the Cosmic Forge (\$59.95)

has captured the title of Top Role Playing Game, according to the readers of Computer Gaming World, and now it's after the hearts and minds of Mac users everywhere. But first, Mac players will need to forget their Apple Macintosh windows and pull-down menus.

Sir-Tech Software felt that the computer power needed for combining action and adventure simply asked too much of the Apple interface. So Sir-Tech wrote its own. This game requires 1 megabyte of memory, and 1800K of system memory must be free on color Macs (800K on black-and-white). To install it on a hard drive, you need 2.5 megabytes of free disk space.

In the best tradition of fantasy role-playing, this game calculates your every step — and the full-color animated graphics will knock your armor off.

Contact the company at P.O. Box 245, Ogdensburg Business Center 2E, Ogdensburg, NY 13669, (315) 393-6633, or circle 355 on the Reader Service card.

NEW-PRODUCT FOCUS

▲ MAC ◆ APPLE II ■ APPLE IIgs

▲ ◆ ■
School Days

If your school has assembled a motley crew of mature Apple IIs, Macs of a certain age, and old MS-DOS computers, **SchoolWorks:Department Head** may be the solution.

This product is a set of templates designed for use with AppleWorks on the Apple II or IIGS, or for use with Microsoft Works on the Mac or an MS-DOS compatible. From the principal's office to the classroom, these templates help you inventory supplies, write, revise, and review lesson plans, record your classroom observations of teachers, and file their addresses, telephone numbers, and other pertinent information.

The documentation is in the software, and the \$55 purchase price includes a site license for your entire school — it makes sharing information simple and legal. For more information contact K-12 MicroMedia Publishing at 6 Arrow Road, Ramsey, NJ 07446, (800) 292-1997, or circle 356 on the Reader Service card.

▲ ■
Address Master

Looking for an easy, inexpensive way to keep simple records on your Apple IIGS or Mac? Try Prelude Software's **Address Master** (\$39.95).

Address Master lets you maintain multiple files of names, addresses, telephone numbers, and other data. You can sort records and print them as mailing labels, then sort them by ZIP code to take advantage of lower postal rates. You can also print a pocket-sized address book.

A unique feature of Address Master is that the Apple IIGS and Macintosh versions can

each use and process files created on the other — as well as on the MS-DOS version. For details contact Prelude Software at P.O. Box 1317,

The screenshot shows a software window titled "Address Master" with a menu bar (File, Edit, Record, List, Options). The form contains fields for Name 1, Country, Name 2, Telephone 1, Address 1, Telephone 2, Address 2, Telephone 2 Extension, City, Relationship, State, Remarks, ZIP Code, and Mailing List. At the bottom, there are radio buttons for "Save - New Personal", "Save - New Business", "Save - Dates Screen", "Save - Clear Screen", and a "Cancel" button. A note at the bottom says "PRIMARY FIRST NAME: Type up to 10 letters and press RETURN."

Costa Mesa, CA 92628-1317, (714) 751-5736, or (800) 678-7613, or circle 357 on the Reader Service card.

NEW HARDWARE▲ ◆ ■
I Need My Space, Dude

Hard drives have been shrinking in size and price, and growing in capacity. Plus Development Corporation is working on the Macintosh Classic market with the Impulse series of SCSI storage devices. The **Impulse 105S/C** (\$599) is 105 megabytes tiny, as it replaces Apple's standard hard drive and meets the unusually low-power restrictions placed on the new Macs. For more information contact Plus Development Corporation at 1778 McCarthy Boulevard, Milpitas, CA 95035, (408) 434-6900, or circle 358 on the Reader Service card.

External enthusiasts should check out Tulin's 120-megabyte **Half Shell** for the Apple II and Macintosh. It's platinum, it's SCSI, and it's half the size of an Apple 5.25-inch drive. Tulin claims an average access time of 19 milliseconds, but with a list price of \$789, which includes an Apple

High-Speed SCSI card, blazing speed may not be a factor. For more information contact Tulin at 2156H O'Toole Avenue, San José, CA 95131, (408)

432-9025, or circle 359 on the Reader Service card.

▲ ◆ ■
Hard Disk with Everything

As the prices of external SCSI hard disk drives for the Apple

II drop, you probably aren't surprised to hear that a 100-megabyte Quantum subsystem drive with a 12-millisecond effective access time, drive heads that park themselves automatically, a push-button SCSI ID selector, RAM caching, and a full one-year warranty is available for only \$599.

But would you believe that **Resource Central's 100-megabyte drive** also includes on the disk, at no extra charge, every issue of *A2-Central/Open-Apple* ever published, a complete set of *Apple Technical Notes*, sample issues of *8/16-Central* (for programmers) *Stack-Central* (for HyperStudio users), *TimeOut-Central* (for AppleWorks and TimeOut users), and *Hyperbole* (for literary types curious about hypermedia), in addition to the usual roundup of public-domain and shareware utilities, graphics, patches, font editors, icon editors, and games?

Believe it. Resource Central also sells a **42-megabyte hard-disk drive** with removable media (for foolproof backups and easy transport) for only \$699. These drives require a SCSI interface card (available separately from Resource Central) and will work with any

Apple IIe, IIGS, or Laser Apple-compatible computer. (They work with Macintoshes, too, but you'll need to format the disk yourself and destroy all that value-added data.)

For more information contact Resource Central at P.O. Box 11250, Overland Park, KS 66207, (913) 469-6502, or circle 360 on the Reader Service card.

NEW RESOURCES◆
Special Topics

High-school math teachers often wonder, "How can I motivate my students who are way ahead of everybody else?"

William K. Bradford's **Special Topics in Mathematics** series is designed with those students in mind. It's for academic achievers in middle or high school who want to study subjects not usually seen in high-school math classes — such as logic, probability, permutations, and combinations — and expand their knowledge of math and develop their thinking skills, too.

The program teaches each subject at two levels, making a total of six disks — *Logic Level I and II*, *Probability Level I and II*, *Permutations and Combinations*. All six disks (also available for MS-DOS computers) cost only \$270, a savings of 50 percent off the \$90 price of a single disk. Bundles of two disks are \$90, at the same significant savings.

Contact William K. Bradford at 310 School Street, Acton, MA 01720, (508) 263-6996, (800) 421-2009, for more information, or circle 350 on the Reader Service card.

NOTES

USERS AND PROGRAMMERS Sharing the Power to Create

AW Tip: Put your creativity to work and expand your use of the AppleWorks Clipboard. Let's discuss several methods of exchanging data in AppleWorks 3.0.

- Open apple-C (OA-C) in all modules copies data to and from the Clipboard. OA-C copies database records, spreadsheet rows, columns, and blocks, and any portion of word-processing files into the Clipboard for direct pasting to files in the same or other modules. But when you copy information from the Clipboard it may land differently in the destination file. When you copy data from the database to the spreadsheet, for example, records become rows, categories become columns, and visa versa. (This feature is handy for manipulating numerical data in a database.) Providing that you've opened enough categories in the destination database file, when you move information, all data will transfer.

When you paste spreadsheet data into the word processor (whether it's copied to the Clipboard as a row, a column, or a block) each spreadsheet row will become a word-processor paragraph with tabs inserted between spreadsheet columns. Information from the database arrives in similar fashion — records become paragraphs with tabs between categories. When you copy word-processing data to either the spreadsheet or a database and no tabs are present in the source document, each line in the word processor will be copied to the first category of the corresponding database record, or the first column in the corresponding spreadsheet row. When tabs are present in the source word-processing file, though, the data will land in successive categories or columns when you copy it to the database or spreadsheet. Returns in the word processor paste the data in subsequent database records or spreadsheet rows.

Copying data to and from the Clipboard to the same type of file places information exactly as it appeared in the source file (assuming the tabbing is the same in a word-processing file or the number of categories is the same in a database file).

- OA-M in all modules moves data to and from the Clipboard. This command's results are almost identical to the *Copy* command (OA-C), except it removes data from the source file. It uses less RAM, so favor it if your system has memory restraints. You can preserve the original data by working with a renamed backup of the original source file. AppleWorks won't allow movement of all the records from a database. Adding a "ZZZ" dummy record to your database lets you move all the records you want.

- OA-P in databases and spreadsheets prints data to the Clipboard.

Printing to the Clipboard is similar to printing on paper, except what you see on screen is all you print to the Clipboard. When you move data from the Clipboard to a spreadsheet or database all data will appear in either one spreadsheet column or one database category. Use this technique to combine two or more database categories. (See "AW Macros," April 1991, p. 18, for another method of combining categories.)

- OA-P in the database prints data to the Clipboard for mail-merge functions.

Although you can use this powerful command only in the database module, if you copy or move spreadsheet or tabular word-processing data to the database as described in the instructions above, you can employ this command on all data.

Also use the mail-merge function to create a boilerplate or glossary-type application by copying word-processing lines and tabs: Copy the data directly to the database via the Clipboard, then print to a word-processing document using the mail-merge feature. You can also use the mail-merge feature to copy data from selected categories in a database to the spreadsheet, or back to a database file.

AW Macros: The macro below changes all the values in the "Price" Category in the illustrated (or a similar) database by a factor entered by the user. This macro demonstrates using the Clipboard and spreadsheet in making numerical changes in a database. Start the macro with SA-P from within the database file.

APA MAINTAINS PUBLIC-DOMAIN, FREWARE, AND SHAREWARE FILES INCLUDING TEMPLATES, PATCHES, AND INFORMATION THAT IT MAKES AVAILABLE TO APPLEWORKS CLASSIC USERS. FOR A 5.25-INCH DISK THAT INCLUDES TEMPLATES, MACROS, DETAILED DOCUMENTATION FOR TIPS DESCRIBED ABOVE, AND THE POPULAR "PATCHER" PROGRAM THAT FIXES SOME FLAWS IN VERSION 3.0, SEND \$4 SHIPPING TO APA AT THE ADDRESS BELOW. PLEASE INCLUDE THE *INCIDER/A+* ISSUE DATE WITH YOUR REQUEST. FOR MEMBERSHIP INFORMATION CONTACT THE APPLEWORKS PROGRAMMERS ASSOCIATION, 6531 LEXINGTON AVE., LOS ANGELES, CA 90038, MODEM APA@PRO-APA.CTS.COM (213) 463-9289, VOICE (213) 469-9916. THE APPLEWORKS PROGRAMMERS ASSOCIATION IS REGISTERED WITH THE APPLE USER GROUP CONNECTION.

Database Template:

Stock #	Item	Dept	Price	Note	X1	X2
1001	Chair	Furniture	63.95	Dining	-	-
1002	Table	Furniture	79.45	Oak top	-	-
ZZZ	ZZZ	ZZZ	(This is a dummy record) - -			

Macro:

```
P:<adb:q = peek $0c54: {Identify current file}:
msg 'Enter price change factor - (ie: .85, 1.15, etc.) - and press RTN ':
$0 = getstr 6: zoom: oa-1: {Get factor, to MRL, and top of file}:
oa-m>t<oa-9 up rtn: {Move all but dummy to Clipboard}:
oa-q esc rtn up:
rtn rtn>temp.asp<rtn: {Create temporary spreadsheet}:
oa-m>f<right right right: {Move data to ASP - position cursor}:
msg 'Place cursor in price column - Press RTN to accept ':
keyto 13: {Get confirmation of position}:
right: oa-l>c1<rtn: {Insert new column}:
>@round(<left>*<print $0>,2)<rtn: {Type formula}:
oa-c>w<rtn down>.<oa-9 rtn oa-n: {Replicate formula}:
oa-c>tb<oa-9 rtn oa-1 oa-c>fv< {Strip formulas leaving raw numbers}:
oa-l>c<rtn rtn rtn>2<rtn: {Change layout to Fixed-2}:
left oa-d>c<rtn: {Delete column with old prices}:
oa-c>t<rtn oa-9 rtn: {Copy new data to Clipboard}:
poke $0c6c,0: esc>4<rtn rtn: {Remove temporary ASP file}:
oa-q print str$ q: rtn: {Get back to database}:
oa-m>f<msg 'Operation Complete ' >!
```


THE ARCHITECTURE OF SOFTWARE PIRACY

“Interapplication communications” makes software piracy even more of a temptation.

In the Computer Museum in Boston, Massachusetts, there’s a computer made of Tinkertoys. Theoretically, it could run any program your computer can, given enough time and Tinkertoys. You see, any two computers are more alike than they are different: Each has several memory chips and one chip that adds numbers. Your computer, in theory, can run any program “written for” the IBM PC, the Macintosh, or the Apple II. It might require secrets from the program’s writers that they’re not willing to share — specifically



By PAUL STATT + SENIOR EDITOR

the “source code.” It also might not run every program fast. But any computer is capable of carrying out any arbitrary calculation — and any piece of software, from VisiCalc to HyperCard, is just a string of calculations.

Every microcomputer is controlled by a program stored in its memory. John von Neumann realized that data and programs could be treated the same, and designed the first modern computer. His legacy is that I can give Microsoft Word to a colleague as quickly as I can give him or her a text file. It’s easy — you may have noticed — to copy software.

Computer and software developers are running hard against this same wall — called “von Neumann architecture” — but from different directions. The software peddlers hope you don’t notice that after spending 45 seconds installing your new program on your hard disk, you could do the same for every hard disk in the building in about 45 minutes. They wouldn’t mind if you believed that it would work not only just on your *type* of computer, but solely on your *individual* computer, as well.

The inventors of the digital computer didn’t foresee that computer programs would be bought and sold. They designed computers that would make it easy to run the same program on two different machines. They did foresee, and planned, that programs would be as portable as data, because unless two different computers could run one program, data and programs couldn’t share the same physical space on a single computer, whether it contained transistors, vacuum tubes, or silicon chips. If one computer is to run different programs, programs must be easy to copy. Programs are designed to be portable.

I don’t mean to give piracy a good name, but I just saw someone from Apple show off System 7.0 (the Mac’s new operating-system software) and create an “alias” of his Mac’s hard disk. An alias isn’t a copy, but it works just like one on a network. The Apple representative bragged that he can now run all the (legal) software on his hard drive on any Mac on the same network. An “office on a disk,” he called it. Another representative showed me how my LC, which lacks a math coprocessor and drafts complex documents slowly, can get a Mac IIx on the same network to do its arithmetic for it — even using a different program. Why buy two copies?

I’m impressed. These are features, not problems, of System 7.0. (See p. 24 in this issue for more on the technology.) Apple says that this is only the beginning of a brave new world of “interapplication communications,” which will tear down the barriers that separate individual computers as completely as Berliners demolished their wall in 1989. *Wunderbar*. But I expect problems.

Software piracy isn’t going to go away because the Software Publishers Association convinces enough users it’s wrong. It won’t go away until computers are unable to run more than one program. But every new crop of computers and system software is making it easier, not harder, to use the same software on two or more machines. Good will won’t do the trick. Perhaps site licensing will. But I’m glad I’m not in the software development business, struggling to keep pirates armed with machines designed for copying software from copying software. □

Get the power of AppleWorks GS working for YOU!

Introducing the ALL NEW Art Gallery II!

**BOLD IMAGES! LARGE GRAPHICS!
UNIQUE BORDERS! SPECIAL MESSAGES!**

NOW AVAILABLE! Art Gallery II has just what you need to add zip to your next AppleWorks GS desktop-publishing project! Whether it's a club announcement, school report, business flyer, or personal memo... **Art Gallery II** gets people's attention with eye-catching graphics!

Designed exclusively for *inCider/A+*, this collection gives you a wide variety of high-quality, crisp, clean images to choose from. Our first Art Gallery was so popular that we created this second collection with bolder, larger graphics. **PLUS**, we made it even better by adding exciting, unusual borders and special messages merged with graphics. **OVER 200 ORIGINAL IMAGES IN ALL!**

JUST \$39.95!

And to complete the package, extensive documentation is included in a 20-page manual with step-by-step instructions and illustrations of every graphic.

STILL AVAILABLE! Get more of a good thing!

A limited supply of **Art Gallery I** is still in stock. Great clip-art at a great price! **Just \$39.95** for over 200 pieces of original artwork **PLUS** a reference chart with complete instructions and illustrations.

At last, all the power of AppleWorks GS without all the work!

Improve your personal productivity while you become an AppleWorks pro with AppleWorks GS Productivity Paks. Created by Cynthia Field, *inCider/A+*'s "Press Room" columnist, these ready-to-use template collections are available only through *inCider/A+*.

With each Productivity Pak you get ten ready-to-use templates to make easy work of your home, business, and school projects! Each project includes a blank template and a completed sample to use as a model. Plus, you get an extensive manual to guide you step-by-step through each project.

JUST \$29.95 each! Less than \$3 per template!

AppleWorks GS Productivity Pak I

MEMO PADS ▼ MEMBERSHIP ▼ NAME BADGES
MERGE DOCUMENT ▼ AUTO MILEAGE LOG ▼ RESUME
NUTRDATA ▼ CHECKBOOK ▼ BUDGET ▼ NEWSLETTER

AppleWorks GS Productivity Pak II*

LIVING WILL ▼ FAMILY TREE ▼ BOOKLET
HOME BUYER'S GUIDE ▼ VIDEOTAPE LIBRARY
CUSTOM CALENDARS ▼ INCOME TAXES ▼ COOKBOOK
CAR-COST COMPARISON ▼ COLLEGE GUIDE

* Requires AppleWorks GS v. 1.1. AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation.

YES!

ORDER TODAY! For Immediate Service Call Toll-Free 1-800-343-0728 (in NH 924-0100)

I want to get the power of AppleWorks GS working for ME!

Please send me the following *inCider/A+* Special Products:

ART GALLERY*

☐ Volume I ☐ Volume II **Just \$39.95 each!**

APPLEWORKS GS PRODUCTIVITY PAK*

☐ Volume I ☐ Volume II **Just \$29.95 each!**

BACK TO SCHOOL SPECIALS!

Take two for **just \$59.90! SAVE \$10!**

- ☐ Art Gallery I & AppleWorks GS Productivity Pak I
☐ Art Gallery II & AppleWorks GS Productivity Pak II
☐ ALL FOUR items for **just \$99! SAVE OVER \$40!**

Name _____

Address _____

City/State/Zip _____

☐ Payment enclosed (payable to *inCider/A+*)

Charge my: ☐ MasterCard ☐ Visa ☐ American Express

Card # _____ Exp. Date _____

Signature _____

Canadian orders: add 7% GST. Foreign air mail: add \$3.95. Foreign orders must be paid in U.S. funds drawn on a U.S. bank.

* Requires AppleWorks GS v.1.1. AppleWorks is a registered trademark of Apple Computer, Inc., licensed to Claris Corporation.

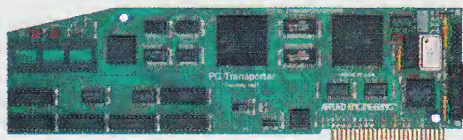
181A

***inCider/A+* Special Products, 80 Elm Street, Peterborough, NH 03458**

.... Preferred Hardware at Preferred Prices!

PC TRANSPORTER CORNER

**We offer the best prices, best service,
and widest selection
on all PC Transporter products!**



**- Shop Both Sides of
the Software Aisle -**

PC Transporter	\$239
IIGS Kit	\$36
Ile/II+ Kit	\$29
MS DOS 4.01	\$85
Transdrives	
Combo 5.25" & 3.5" reads & writes 360K & 720K	\$289
Dual 5.25"	\$284
Single 5.25"	\$189
3.5" 720K Add-on	\$99
5.25" Add-on	\$125

Keyboards/Monitors	
Honeywell KB w/cable	\$89
Headstart M1152C Digital Monitor w/cable	\$159
Leading Technology Digital Monitor w/cable	\$229

- PCT SPECIALS -

IBM Compatible 101 key Keyboard with AE's IBM keyboard cable and PCT System disk v2.04	\$79
(you save \$100)	

.... R.G.B. Monitors/Video

Applied Engineering	
ColorLink RGB (for RamWorks)	\$103
Digital Vision	
Computer Eyes GS (color)	\$199
Computer Eyes (B&W)	\$108
HeadStart	
New! M1152C Digital Monitor for Ile and/or PCT (includes cable)	\$159
Leading Technology	
New! 1452C Digital Monitor for Ile and/or PCT (includes cable)	\$229
Magnavox	
CM135 Analog/Digital RGB Monitor (includes digital cable - Ile, GS)	\$289
IIGS Analog Cable	\$25



Quickie Scanner by Vitesse

The fast, smooth, uncomplicated
hand-held scanner that made
InWords possible. Scan true gray,
B&W, or text into your IIGs, Ile,
or Laser 128. Features include
320/640 mode, landscape &
portrait scan, cut/paste, fat bits,
resize, rotate, flip, NDA, multiple
windows and much more!

Quickie Scanner	\$199
Quickie w/InWords	\$269

.... Additional Hardware

Applied Engineering	
TimeMaster HO (GS, Ile, II+)	\$79
Serial Pro (GS, Ile, II+)	\$109
Parallel Pro (GS, Ile, II+)	\$77
Buffer Pro 32K	\$85
Buffer Pro 128K	\$95
Buffer Pro 256K	\$109
Sonic Blaster (GS)	\$74.95
Audio Animator (GS)	\$169
Phasor (GS, Ile, II+)	\$77
Conservator Fan (GS)	\$77
Converter Drive Cable	\$17
Ile/II+ Power Supply	\$59.95
IIGs Power Supply	\$89
CH Products	
MACH III Joystick	\$39
MACH IV Plus	\$69
SPECIAL! — Mirage ADB/Quad	\$29
Kensington	
System Saver (II+, Ile)	\$69
System Saver GS	\$75
Turbo Mouse ADB (GS, Mac)	\$124
KeyTronics	
ADB Keyboard (PCT/GS)	\$139
Vitesse	
Quickie Scanner (GS, Ile)	\$199

..... Storage Devices

Applied Engineering	
Vulcan Hard Drives include controller card and come pre-formatted with the latest system (specify machine).	
Vulcan 20 Mb	\$499
Vulcan 40 Mb	\$569
Vulcan 100 Mb	\$949
New! 3.5" 1.6 Mb (GS)	
3.5" 800K (GS, Ile, II+)	\$189
3.5" Controller Card (Ile, II+)	\$65
5.25" Disk Drive (all Apple II's)	\$124
5.25" Controller Card (Ile, II+)	\$55
AMR	
GS Partner Hard Drives	Call
Apple	
High Speed SCSI (GS, Ile)	\$109
EMAC	
SPECIAL! — Impact 20 Mb	
FAST SCSI Hard Drive —	
2 year warranty!	\$359
w/Apple SCSI	\$459
New! Impact 80 Mb SCSI	\$699
w/Apple SCSI	\$799

**We carry thousands
of Apple and
Macintosh Products.
If you don't see it
in our ad,
give us a call!**

..... Accessories

Mouse Pads	\$7.95
Ribbons	
Imagewriter I/II (black)	\$3.50
Value Pack (5 ribbons)	\$14.50
Imagewriter I/II (color)	\$5.99
Value Pack (3 ribbons)	\$16.50
SPECIAL! — QVC Surge/Modem	
Protector provides 6 outlets, two phone jacks and 15 Amp circuit breaker.	
Don't get ZAPPED!!	\$34.95
(Suggested Retail - \$55.95)	



Vulcan 40 & 100 Mb

The Cadillac of Apple hard drives
given a "5-star" rating by InCider.
Vulcan comes complete with a
heavy duty power supply, 16 bit
ultra fast controller (GS), built-in
CDA, pseudo-slotting, and support
for GS/OS, ProDOS, DOS 3.3,
Pascal 1.3 & CP/M.

Now Only —

Vulcan 40 Mb	\$569
Vulcan 100 Mb	\$949

..... Memory Expansion

Applied Engineering	
New! Uses inexpensive 1 Mb by 4 chips!	
GS-Ram III 1 Mb (GS)	\$139
GS-Ram III 2 Mb (GS)	\$199
GS-Ram III 4 Mb (GS)	\$319
GS-Ram Plus 1 Mb (GS)	\$205
GS-Ram Plus 2 Mb (GS)	\$292
GS-Ram Ultra (GS)	Call
RamWorks III 256K (Ile)	\$139
RamWorks III 1 Mb (Ile)	\$227
RamFactor 256K (Ile, II+)	\$175
RamFactor 1 Mb (Ile, II+)	\$264
RamCharger	\$139
Ram Express II 256K (Ile, II+)	\$146
Ram Express II 1 Mb (Ile, II+)	\$205
Z-Ram Ultra 2 (with clock) 256K	\$199
1 Mb	\$285
Memory Chips	
1 Mb Chips (bank)	\$59
256K Chips (bank)	\$24

..... Communications

Applied Engineering	
SPECIAL! — FREE ReadyLink Software with purchase of	
DataLink 1200	\$95
DataLink 2400 bps (int.)	\$160
DL 2400 w/SendFAX! (GS)	\$199
DataLink Express 2400 (ext.)	\$169
DL/X 2400 w/MNP-5	\$199
DL/X 2400 w/MNP-5 & FAX	\$239
ZOOM Modems	
7 Year Warranty • Parts & Labor	
Zoom MX 2400 (ext.)	\$98
Zoom/Modem V.42bis	\$199
Modem Cables	\$15
US Robotics	
Courier HST Dual Standard	\$949
Macintosh	
DataLink LC	\$229
DLIC 68882 Chip	\$119
QuadraLink Multi-Port Serial Board for Mac II's	\$199

Seiko DataGraph 2001

A complete hardware/software system that puts a
scheduling/message center right on your wrist!
Store appointments, birthdays and important
messages up to 23 months in advance on your
Seiko 2001 Stainless Steel watch.

Compatible with Apple II+, Ile and IIG.

Special \$39.00

..... Accelerators and Co-Processors

TransWarp GS (make your GS 2 1/2 times faster!)	\$239
TWGS 32K Cache (Make your TransWarp GS 22% faster!)	\$79
TransWarp (Original, reliable accelerator for II, II+ and Ile)	\$99
Z-80 Plus (Run Apple CPM programs on your GS, Ile or II+)	\$131



To Order, Call 1-800-327-7234

P.O. Box 815828 • Dallas, Texas 75381 • FAX (214) 247-8151

Preferred Software Too!

TIMEWORKS Publish It! 4



Voted "Best Desktop Publishing Program of the Decade" by Classroom Learning, Publish It! 4 requires no previous DTP experience to produce top-quality, professional looking, colorful documents. Publish It! 4 supports laser printers and most popular dot matrix printers.

Special \$87.00

Education

Advanced Idea's

Audobon Wildlife Adventures
Grizzley Bears or
Whales GS\$39.50

A.E.C.

Spanish or French Vocabulary
or Grammar\$19.50

Return of the Dinosaurs\$28.50

Barron's

Computer SAT\$31.50

Broderbund

Bannermania\$24.50

Carmen Sandiego GS (World,
Europe, USA & Time)\$29.50

Geometry\$54.50

Katie's Farm or McGee\$24.95

Playroom\$24.95

Science Tool Kit

Module 1 or 2\$51.50

VCR Companion\$32.50

Britannica

Algebra 1st or 2nd Semester\$32.50

Algebra 1st & 2nd Semester\$48.50

Revolution (GS)\$27.50

Davidson & Associates

Alge or Math Blaster Plus\$32.50

Math Blaster Mystery\$32.50

Word Attack Plus\$32.50

Learning Company

Math or Reader Rabbit\$24.50

Writing and Publishing Cntr.\$36.95

MECC

Calendar Crafter, home\$32.50

Oregon Trail\$24.50

USA or World Geograph GS\$52.50

Word or Number Munchers\$23.50

PC Globe

GeoQuiz or GeoPuzzle\$24.95

Orange Cherry

Talking Schoolhouse SeriesCall

Software Toolworks

Mavis Beacon Typing GS\$32.50

Mavis Beacon Typing IIe\$26.50

Weekly Reader

New Talking Alphabet,
Shapes or Opposites\$29.50

Stickey Bear ABC's, Numbers
Opposites or Shapes\$24.50

Other Stickey Bear TitlesCall

Entertainment

Accolade

Grand Prix\$27.95

Jack Nicklaus Golf GS\$34.50

Test Drive II or Mean 18 GS\$29.50

Britannica

Gnarly Golf or Jigsaw\$19.95

Great Western Shootout\$19.95

Laser or Task Force\$19.95

California Dreams

Blockout\$22.50

Tunnels of Armageddon\$22.50

Vegas Gambler\$22.50

Electronic Arts

Madden Football\$39.95

Bismark\$12.95

Bards Tale & Bards Tale IICall

Lucasfilm Games

Pipe Dreams\$24.50

Maniac Mansion\$19.50

Software Toolworks

Chessmaster 2100 GS
(includes classic games disk!)\$34.50

Life and Death\$34.50

Other Entertainment Software

Crystal Quest GS\$32.95

Hunt for Red October\$22.50

Battle Chess\$31.95

Space Ace\$36.95

Tetris\$24.95

2088: The Cryllian Mission\$35.95

**Travel the Oregon Trail and
Munch Words & Numbers
along the way with MECC's
hottest new programs!**



Oregon Trail - Award winning
adventure simulation. Hunt
buffalo, raft down treacherous
rivers, trade for supplies and
much more!\$24.50

Word & Number Munchers -
Hungry munchers are on the
loose, feasting on words and
numbers. Only your expertise
can save the day from the
menacing troglites!\$23.50

Communications

Applied Engineering

ReadyLink\$59.50

Beagle Brothers

Point to Point\$59.95

TimeOut Telecom\$39.50

Insync

Proterm\$79.50

Morgan Davis

Modem Works\$49.00

Proline BBS Software\$169.00

Graphics

Abracadata

Design Your Own Architecture,
Interiors or Landscape) GS\$53.95

Interiors or Landscape Library\$22.50

Beagle Brothers

Platinum Paint\$57.50

Broderbund

New Printshop\$29.95

Printshop GS\$36.50

PS Graphics Library Party\$22.50

Printshop Companion GS\$29.95



Design your own home archite-
cture, interiors or landscape with
Abracadata's popular new series.
Each program offers pre-drawn
shapes, side views, scaling, and
much more! For home design,
interior planning and landscap-
ing, Abracadata has the answer.

Apple II\$42.50

Apple IIGs\$53.95

Libraries (all Apple II's)\$22.50

Productivity

Beagle Brothers

AppleWorks 3.0 Companion\$23.50

Beagle Write GS\$59.95

Outliner for AppleWorks 3.0\$42.50

TimeOut Decision Pak\$89.50

TimeOut Performance Pak\$69.50

TimeOut Power Pak\$32.50

TimeOut ReportWriter\$48.50

TimeOut Style Pak\$79.50

TimeOut Texttools\$32.50

TimeOut SuperForms or
SuperFonts\$42.50

Broderbund

Bank Street Writer Plus\$49.50

Claris

Appleworks 3.0\$174.00

Appleworks GS\$209.00

Roger Wagner

Hyper Studio\$84.50

Seven Hills
Graphic Writer III (GS)\$89.95

Timeworks

Graph-it\$53.00

Publish-it 3\$77.00

Word Perfect

Word Perfect IIe or GS\$105.95

Utilities

Applied Engineering Upgrades

AppleWorks 3.0 Expander\$15.00

Vulcan Utilities "v1.4.6"\$15.00

PC Transporter "v2.02"\$15.00

Other UpgradesCall

Byteworks

Full Line AvailableCall

Central Point Software

Copy II+ "v9.1"\$27.50

Copy II+ "v8.4"\$11.95

Glen Bredon

Prosel 16\$54.95

Prosel 8Call

Dos. MasterCall

Morgan Davis

MD Basic\$49.00

Micol

Micol Basic IIe\$59.95

Micol Basic GS\$89.95

Roger Wagner

Full Line AvailableCall

Soft Spoken

Cross-Works "v2.0"\$68.50

Vitesse

Harmony\$33.50

Salvation Deliverance,

Exorcisor or Renaissance\$29.50

Salvation Supreme Pack\$119.95

Salvation Wings\$49.50

Westcode

Inwords (requires scanner)\$78.00



**Take advantage of any of the
Salvation Utilities separately,
or purchase them all in one -**

SALVATION SUPREME!

- Backup (Backup and Restore)
- Renaissance (Disk Optimizer)
- Exorciser (Virus Detector & Cure)
- Deliverance (Directory Repair & File Recovery)
- Wings (Program Manager/Launcher)

**For Your Apple IIGs.
Everything you need & more!!!
Salvation Supreme ...\$119.95**

Why buy from us?

- 15 day money back guarantee on hardware. If it doesn't meet your needs, we'll refund the purchase price. No hassles!
- We handle only the industry's best hardware and software.
- All memory cards come with factory installed & tested RAM.
- We're nice guys that want to help. We want our business to grow because of repeat customers & word of mouth.
- UPS and Federal Express Next Day Service available.

Preferred Computing

To Order Call
Toll-Free

1-800-327-7234

FAX your Order: 214-247-8151

Questions and Customer Service Call 214-484-5464



VISA, MasterCard and COD orders accepted. Order by phone, mail or FAX. School and Government Purchase Order's welcome. Special and Sale items may be limited quantities. Prices and Specifications are subject to change without notice. Please verify product compatibility before ordering. Texas residents add 7.25% sales tax.



APPLE CLINIC

BACKING OUT GRACEFULLY

**Is reverse on an ImageWriter II easier to find
than it is on a Volkswagen Bug?**

By CECIL FRETWELL

DOUBLE REVERSE

I PRINT LETTERHEADS, CHECKS, and so on with my ImageWriter II. Each time I print I must back the continuous-feed paper out of the printer manually before I insert my letterhead or check. Is there a simple command to make the paper reverse itself?

Jerry Fingerman
Richfield, MN

You don't mention the software package you're using, so I'm a bit in the dark. If you're using a dedicated accounting or finance program, you may be out of luck. If you're using a program that lets you send control codes to the printer (such as AppleWorks 3.0 or AppleWriter), your task is fairly simple.

The character code for the escape key followed by a lowercase "r" will make your ImageWriter II reverse line feed one line. If you know BASIC, the following code fragment will make the paper reverse one inch if your vertical pitch is set at six lines to the inch.

```
10 PRINT CHR$(4); "PR#1"
20 FOR I = 1 TO 6
30 PRINT CHR$(27); CHR$(114)
40 NEXT I
50 PRINT CHR$(4); "PR#0"
```

If you're using a word processor, insert six "ESC r" combinations to reverse your paper feed.

VULCAN LOGIC

WHEN I USE THE QUIT OPTION from any Apple II software to get back to the Finder on my IIGs (which is equipped with an Applied Engineering Vulcan 40-megabyte drive), I receive the error message *EXPRESSLOAD ERROR: 114D*. It used to work correctly, but I messed up somewhere. Can you help me?

Harold Miller
Valley Stream, NY

The problem could be your Applied Engineering utilities. Older versions won't work under Apple's System Disk 5.0.4. If you think this is the case, contact Applied Engineering at P.O.

APPLEWORKS CLINIC

By Claris Corporation and the National AppleWorks Users Group

HIDE AND SEEK

Help! I deleted an AppleWorks file from a disk that contained my term paper. Is there any way to get it back?

There's a good chance you can recover the deleted file, particularly if you stopped using the disk as soon as you deleted it. ProDOS, the operating system that manages the disk drives for AppleWorks, doesn't actually delete a file from the disk; it marks the file as deleted in the disk catalog and releases the space on the disk. The system overwrites the space used by that file with newer data eventually, but until then you can recover the file.

Copy II+ offers an "undelete" function (\$39.95; Central Pt. Software, 15220 NW Greenbrier Parkway, Beaverton, OR 97006, 503-690-8090). Just boot it up, select *Undelete* from the main menu, and follow the prompts to display a list of all deleted files still in the catalog. Select the file you want to recover and the program reverses the entry in the disk catalog. ProDOS will read the file once again.

Next, boot up AppleWorks and try to load the file onto the desktop. If the file is intact it will load as if nothing happened. If it doesn't, tell AppleWorks you want to create a new word-processing file from a text (ASCII) file, load the file onto the desktop, and clean it up. Press Open apple-S to save.

DISAPPEARING DATABASE

I wasn't able to load an AppleWorks GS database file onto the desktop recently. Fortunately, I had a backup. Is there any way to recover the damaged file if that occurs again?

Congratulations for keeping a backup! There's no insurance quite as good as having another copy of your work.

Recovering damaged AppleWorks GS (AWGS) files depends on the extent and nature of the damage. You have little hope of recovering files that are damaged internally — that is, files with damaged headers or data. We know of no program

Box 5100, Carrollton, TX 75011, (214) 241-6060. More likely, though, your system files are corrupt. Try using the System Tools disk for Version 5.0.4 to re-install the operating system. Thanks to Floyd Zink and Jim Maricondo for their help answering this question.

IS IT FULL OR NOT?

I'M TRYING TO CONVERT FILES from a DOS 3.3 5.25-inch floppy disk to a newly formatted ProDOS 3.5-inch disk. The process fails with a message telling me that the 3.5-inch disk is full — but there are still files left on the 5.25-inch disk. How can this be? An empty 800K 3.5-inch disk should be large enough to hold everything on the 5.25-inch disk.

John Sackett
Dayton, OH

Information is stored on any ProDOS disk in 512-byte blocks. On a 3.5-inch disk, blocks 2 through 5 contain the root directory for the disk. Each file entry on any ProDOS disk requires 39 bytes, so a directory block can hold 13 entries. (The extra 5 bytes per block are used for system purposes.) If you multiply this figure by four, the entire root directory can only hold 52 entries. The first entry has information regarding the disk volume, such as its name, leaving 51 entries, each of which can be used to identify a file or a subdirectory name.

that can rebuild the internal structure of damaged AWGS files.

The odds are better if the problem is a bad disk or a damaged GS/OS directory. With Vitesse's **Salvation-Deliverance** you can reconstruct bad or damaged directories and volume bit maps (\$49.95; 13909 Amar Road, La Puente, CA 91746, 818-813-1270).

Another option is Glen Bredon's **ProSel-16**, an extensive collection of GS/OS utilities that recover files you can't access because of damaged GS/OS directories or disks (\$89.95; distributed by Charlie's Apple Seeds, 9081 Hadley Place, San Diego CA 92126, 619-452-1297).

Go back to your 5.25-inch disk. Because ProDOS wasn't designed to provide extension of the root blocks beyond the first four, I'll wager that a CATALOG will show more than 51 files.

The solution? Divide the information on your DOS 3.3 into subdirectories; ProDOS will extend subdirectories automatically as they expand.

LASER UDC

I HAVE AN APPLE IIe WITH TWO AMR 3.5-inch disk drives and one DuoDisk drive. Utilizing the UDC card from the Laser computer in slot 5, how can I get AppleWorks to recognize all four drives?

Emmett Woodward
Oregon, WI

If you first daisychain the two AMR drives to the computer, then daisychain the 5.25-inch disks at the end, AppleWorks should recognize the chain.

For this procedure to work, though, you need ROM version 4.0 or later in the Universal Disk Controller card (UDC). To determine what

you have, fire up BASIC to obtain its famous J prompt character. Enter CALL -151 and hit the return key. The ROM monitor system announces itself with the * prompt.

Now enter \$C515, where the second hex digit is the slot number for the UDC — in your case, slot 5. If you see the digits 4030, you have the latest ROM version. If you see an older version, such as version 3, or a date, your controller won't support the daisychain I described. (To receive an updated version of ROM, contact Laser Computer, Inc., at 800 North Church Street, Lake Zurich, IL 60047, 708-540-5022.) If you have version 4.0 and this work-around still doesn't work, you have a hardware problem that requires the assistance of a dealer or a repair service.

APPLE CLINIC IS A FORUM FOR ANSWERING YOUR QUESTIONS ABOUT APPLE II HARDWARE AND SOFTWARE. ADDRESS YOUR CORRESPONDENCE TO APPLE CLINIC, INCIDER/A+, 80 ELM STREET, PETERBOROUGH, NH 03458. BECAUSE OF THE VOLUME OF LETTERS, MOST WON'T APPEAR IN PRINT, BUT WE'LL TRY TO RESPOND IF YOU ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE.

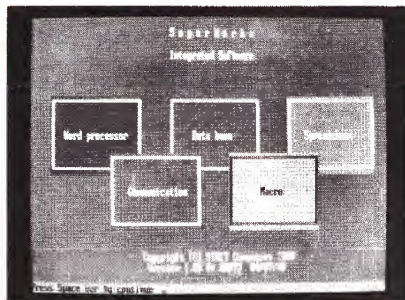
OFFICIAL ANNOUNCEMENT TO READERS

Breakthrough For AppleWorks Users!

The best integrated PC package yet!

Northvale, NJ

Remarkable Technologies announces a breakthrough product which delivers AppleWorks power on an IBM PC or compatible. SuperWorks allows AppleWorks users to step up to a PC along with all their AppleWorks files, utilizing AppleWorks work-alike integrated software.



SuperWorks Features Screen

New features provide complete and full integration of all its capabilities including; spreadsheet (with 3-D capability), database (the easiest to use and one of the most powerful anywhere), word processing (a dynamic and full capability communications package) plus

unlimited keystroke macro capability. It takes only 160K in RAM. In addition, SuperWorks allows you to work with your AppleWorks file on an IBM PC.

As a special introductory offer to inCider readers, SuperWorks will be made available at the special price of \$199.00 (plus \$5.00 for shipping and handling). SuperWorks has a regular retail price of \$400.00. Send your check or credit card information with order form below to Remarkable Technologies, 245 Pegasus Avenue, Dept. SW, Northvale, NJ 07647. Telephone: 201-784-0900. Fax: 201-767-7463

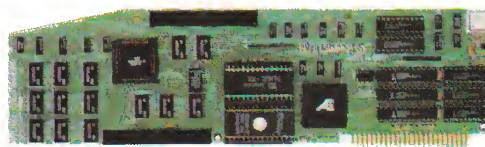
PAYMENT MUST ACCOMPANY THIS ORDER

☐ 0 ☐ ☐ EXP. DATE _____
CARD NUMBER _____
SIGNATURE _____
COMPANY _____
ATTENTION _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____

30 DAY MONEY BACK GUARANTEE



Audio Animator unleashes the sound potential your IIgs was born with. Complete MIDI interface, software and external mixer. \$219



Compute at Warp speed with TransWarp GS. More than doubles processing speed and it's upgradable. \$299 w/8K Cache and \$399 w/32K Cache



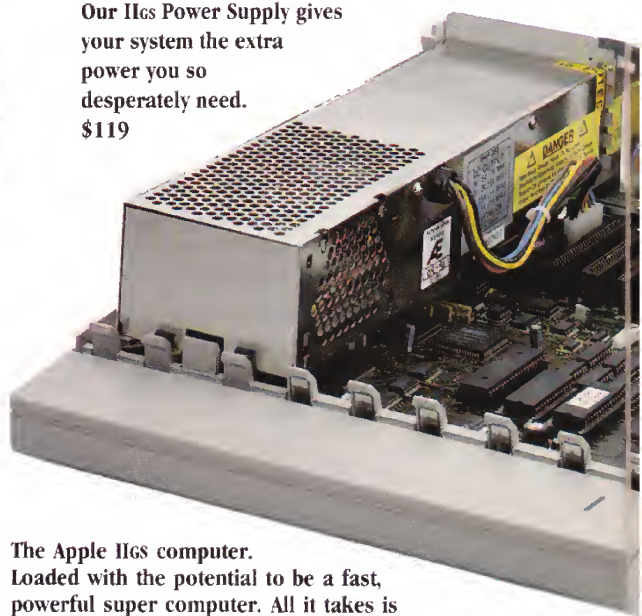
External mixer (included with Audio Animator) places precise control over sound levels at your fingertips.



PC Transporter lets your IIgs run IBM's MS-DOS. Shop both sides of the software aisles. \$349



Vulcan internal hard disk replaces the Apple power supply with 70 watts of pure power and up to 200 MEGs of storage capacity. From \$699.



Our IIgs Power Supply gives your system the extra power you so desperately need. \$119

The Apple IIgs computer. Loaded with the potential to be a fast, powerful super computer. All it takes is a lot of love and a little help from Applied Engineering.

Super System IIgs

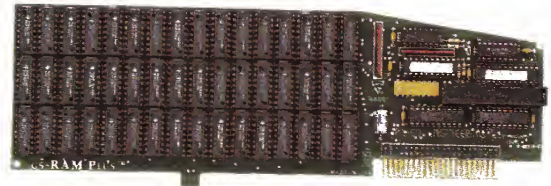
For ten years, Applied Engineering has set the Apple II industry standard for quality and reliability. We do it with top-notch tech support, innovative new products and a commitment to design and build the best products possible. To receive your free 32-page Applied Engineering product catalog, see your dealer or call (214) 241-6060 today, 9 am to 6 pm, Monday through Friday. To place an order, send check or money order to Applied Engineering. MasterCard, VISA, and C.O.D. welcome. Texas residents add applicable sales tax.



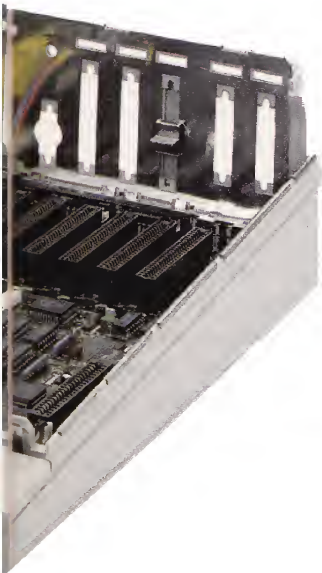
Applied Engineering's 5.25 disk drive (top) features a new design for virtually flawless performance. \$169

MS-DOS compatible 5.25 Drive System (bottom) allows MS-DOS programs on 360K disks to boot from PC Transporter. From \$259

The AE 3.5" Disk Drives are completely Apple compatible. The AEHD can store 1.44 Mb *per disk!* 800K - \$279
1.44Mb - \$339



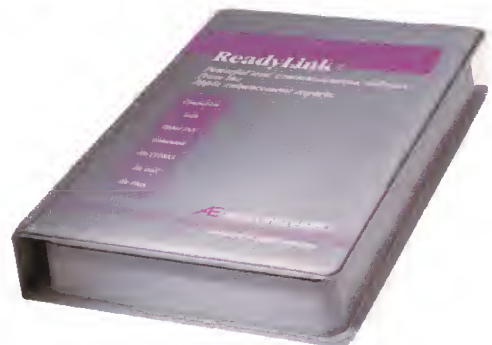
The GS-RAM Plus memory card grows from 1 to 6 Mb, with full compatability. From \$189.



Conservor effectively cools your IIcs while it protects against power surges and helps organize workspace. \$99.



Our modems, both internal and external, are upgradable, Hayes compatible and now have a Send-Fax option. Complete with software and free online time. From \$249.

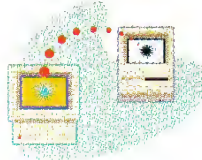


The easiest, most complete, most popular communications software available. It's ReadyLink. \$99.



Applied Engineering®
The Apple enhancement experts.

A Division of AE Research Corporation



BRIDGING THE GAP

LONG LIVE 7.0

Create new loyalty between Apple IIGses
and Macs with System 7.0.

By GREGG KEIZER

THE MAC IS DEAD. LONG LIVE THE Mac. No, the Crown of England hasn't just been passed on. It's something more important, at least to Macintosh users. System 7.0, the long-awaited revision to the Macintosh's operating-system software, has finally succeeded to the throne of the Macintosh empire.

Though not revolutionary in its changes, System 7.0 is certainly the most important — and the most dazzling — upgrade since the Mac's introduction in 1984. From its sharp *TrueType* font technology to its easier-to-use *Finder*, System 7.0 packs a wallop. It makes most Macs more powerful and easier to use, and for the foreseeable future guarantees the Macintosh's spot as king of the graphical computers. And then, strangely enough, System 7.0 will have an immediate impact wherever Apple IIs and Macintoshes work together.

One of the most effec-

tive ways to mix Apple IIs and Macs is with an AppleTalk network. By linking Apple IIGs and Mac computers with LocalTalk cabling, collections of machines can share printers and other peripherals, and most importantly, share files. Until System 7.0, a file-sharing AppleTalk network demanded that you dedicate a Mac as a file server — the computer and hard-disk drive combination that stores common files and runs AppleShare, the network software.

But because you can't use the Mac file server for anything but running the network, AppleTalk networks are uneconomical for many schools and small businesses, and for virtually every home or home office.

System 7.0 changes that. Its built-in file-sharing abilities let you bridge the gap without setting aside a Mac. Here's an overview of how it functions.

Grab a Macintosh. Any Mac that has 2 megabytes of RAM and a hard-disk drive will do.

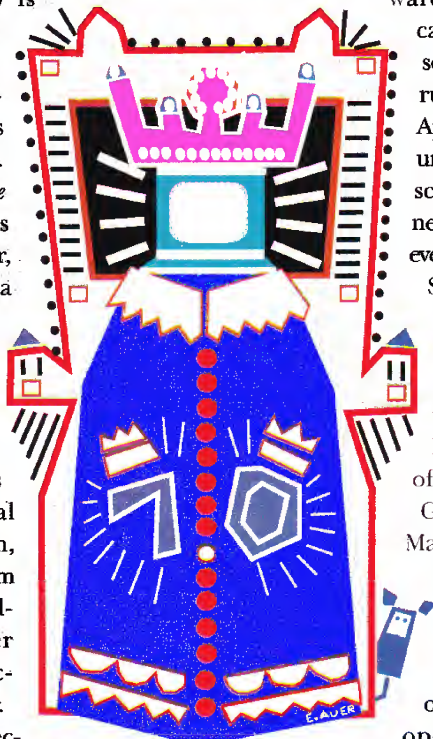
An LC works well, but additional memory always helps make operations run more

quickly. With System 7.0 running on the Mac, you simply choose a folder (or use the *File* menu to create a *New Folder*) that you want to share with others on the network, then select *Sharing* from the *File* menu. Up pops a dialog box, in which you click on *Share this item and its contents* and set access privileges, much as you do when you set up an AppleShare file server. (See **Figure 1.**) You can, for instance, let some users only view files while you let others modify them.

When you're finished setting up this shared folder, it shows up as an AppleShare volume or server on any computer you've designated with privileges. At another Mac, the folder shows on the AppleShare list in the *Chooser*, once you've clicked on both the AppleShare icon and the name of your file server, and followed the on-screen prompts. From an Apple IIGs, the folder appears when you click on the AppleShare icon in the *Control Panel*. Picking the folder from either list puts a new AppleShare icon on the desktop; double-click on the icon and it opens to show the contents of the folder (assuming privileges have been set to let you see those files). You're in business.

Let's take a simple example. Say your students write with **AppleWorks Classic** on two Apple IIGses in the room. You have a Macintosh LC on your desk and pound out reports, notes, and assignments with **MacWrite II**. Through the magic of System 7.0 and **MacWrite II**'s *XTND* (extended-command) translators, you can swap and share files with your students easily. (This technology lets you move a formatted AppleWorks document to the Mac — no ASCII step in between — and open it directly in **MacWrite II**, with all your tabs, underlines, and other settings preserved.)

Make two folders on your LC (one marked *In*, another marked *Out*), designate both as shared folders (choose *Sharing* in the *File* menu), and set the privileges so that all your



students have access. Then create folders within the *Out* folder for every student in your class and set the privileges so that each child has access to his or her own document only. As soon as a student finishes an assignment, he or she calls up the *Control Panel*, selects the *In* folder from the list of AppleShare volumes, double-clicks on the resulting desktop icon to open the folder, and copies the AppleWorks file by dragging it to the folder. At the end of each class, you open the *In* folder on your LC and move the files to your MacWrite II folder.

To review, comment, or change the student's work, fire up MacWrite II, select the AppleWorks translator from the list in the *Open File* dialog box (Figure 2), and open the appropriate AppleWorks file. MacWrite II's XTND translator converts the file to MacWrite II format automatically and retains the original formatting. You're free to comment or suggest changes to the assignment. Once through, you simply save the document as an AppleWorks file by selecting *AppleWorks 2.0* from the *Save As* dialog box, and move it to the *Out* folder.

The next day, students sit down at the IIGs and log onto the file server by clicking on the AppleShare icon in the *Control Panel*. Then they access and open the *Out* folder and their personal folders from your LC's hard-disk drive, and drag their work from those folders to their personal 3.5-inch disks. Now they can run AppleWorks, load the file, and see the changes and comments you've made. The entire process of accessing AppleShare volumes, opening folders, and transferring files takes only a little more time than it does to describe. And as in an AppleShare-equipped network no outside translation utility — not even *Apple File Exchange*, for instance — is necessary.

Your classroom network operates transparently while you have complete control of your Macintosh LC. Thanks to System 7.0, you have an economical network that lets you use the Mac while students send and retrieve files. The only price you pay is a slight slowing of your Mac when others get to its hard-disk drive.

LAUNCH AWAY

Wait! There's more! System 7.0 does more than just share files. With AppleShare-aware software, it can also turn your Mac into a launching pad for Apple II

UPDATE: SON OF PRINTER POLYGAMY

AppleWorks never looked so good for so little. That's what you'll think the first time you push an AppleWorks word-processing, database, or spreadsheet file through a laser printer. Though they may not be filled with fancy fonts, laser-printed AppleWorks documents are clear and sharp. No more blocky characters faded by worn-out ribbons.

May's Bridging the Gap ("Printer Polygamy," p. 68) walked you through some Macintosh and IIGs printer-sharing solutions. PostScript printers make the most sense when you're mixing these two machines and using IIGs-specific software that supports PostScript. But if you're comfortable with AppleWorks Classic, you don't have to do without laser printing, nor do you have to spring for an expensive PostScript-compatible printer.

Hewlett-Packard's **LaserJet IIP** — an affordable laser printer that some analysts predict will sell for as little as \$750 this summer — works well with AppleWorks Classic (\$1295; Hewlett-Packard, 19310 Pruneridge Avenue, Cupertino, CA 95041, 800-752-0900). All you need is **HP11.SEG.ER.SHK**, a public-domain printer driver for AppleWorks 3.0. Available in America Online's AppleWorks software library (under *New Files*), this freeware program adds the IIP to your list of possible print destinations.

Installing HP11.SEG.ER.SHK takes only a few minutes. After you've expanded the squeezed file with **Shrink-It**, America Online's default compression utility for the Apple II, just copy the file SEG.ER to your AppleWorks disk, or to the appropriate folder if you're working with a hard-disk drive. Run AppleWorks, call up a document, and press Open apple-P. Your new printer choice should appear as HP11.LASER.

Calling on the IIP's internal fonts, orientation, and styles (Courier 10- and 12-point and Line Printer 8.5-point; landscape or portrait; normal, italics, and boldface) is as easy as inserting various CI and SC commands in the document. You can also access several other fonts, including a proportionally spaced *Times* Roman font, if you have the appropriate optional cartridge plugged into the IIP.

With the IIP laser printer and this new driver, you can squeeze more on an AppleWorks spreadsheet page (by using smaller type and printing in landscape mode), produce envelopes (though the IIP tends to wrinkle the envelope and/or glue shut its flap), and, of course, generate crisp-looking letters, reports, and other word-processing documents. Remember, too, that you can use the IIP with the Macintosh after you add a third-party package of printer drivers, such as Seven Hills Software's **Independence** (\$39.95; 2310 Oxford Road, Tallahassee, FL 32304-3930, 904-575-0566) or Vitesse's **Harmonie** (\$49.95; 13909 Amar Road, La Puente, CA 91746, 818-813-1270). It's just another way to bridge the printer gap when you have more than one machine on your desktop.

— G. K.

programs such as **AppleWorks GS** and **HyperCard GS**. Like a dedicated file server, System 7.0 lets you copy appropriate applications to a shared folder on a Mac's hard-disk drive via the network, then run those programs from your Apple II.

In another make-believe classroom, where an LC sits on the teacher's desk and three IIGs machines keep the kids company, three copies of AppleWorks GS get fed to IIGs 3.5-inch drives. There's gotta be a better way.

There is. Copy the AppleWorks GS files — using the network connection already established — to the LC's shared folder. Now, with the shared folder still on the IIGs desktop as an AppleShare icon,

double-click on the AppleWorks GS icon. Half a minute later (not blazingly fast, but still quicker than if you were running from floppies), the AppleWorks GS screen appears on the GS. You can write, paint, publish, crunch numbers, and find information to your heart's content.

HyperCard GS works with System 7.0's shared folders, too. That's a big plus for GS owners who can't drop a hard-disk drive next to each IIGs. HyperCard GS, which needs either a network or hard-disk drive, runs perfectly fine from a System 7.0 Mac.

Remember, though, that you must still obey the copyright laws when you're running Apple II software from a Mac-

intosh. If you have three IIGses in the class, you'll need three copies of AppleWorks GS to avoid software piracy. (You put only one copy on the Mac, of course.) Check with the publisher of your favorite Apple II software for information on its AppleShare-awareness, as well as for details on possible site licenses or network packs.

KEEP (APPLE)SHARING

System 7.0 and its file-sharing feature won't eliminate AppleShare and dedicated file servers managing dozens of machines. In fact, long sessions with System 7.0 turned up a major gaffe: You can't share from an Apple IIe.

Even when equipped with an *Apple II Workstation* card, my lab's IIe refused to recognize a Macintosh running System 7.0 as a file server. Well, almost refused to recognize it.

As long as I logged on from the IIe with the same user name and password as the Macintosh's owner, everything worked fine. (AppleShare, which System 7.0's file sharing mimics in many ways, requires that a server be tagged with an owner, usually the network administrator.) The entire contents of the Mac's hard disk were available to the IIe, and I could copy files from Mac to IIe and back. But all attempts to log on with other user names — names registered with the Mac's System 7.0, of course — met with utter failure. The AppleShare IIe Workstation software simply wouldn't recognize the Mac as a file server.

Because you can't connect to a System 7.0 Macintosh from an Apple IIe, except by logging on as the Mac's owner, there's no way to restrict access to a limited number of files. No teacher will want to give all his or her students free run of the Mac's hard disk, which will probably contain, among other things, grades and records of every member of the class. Plainly put, System 7.0 and Apple IIes don't mix.

That's just one reason System 7.0 doesn't make AppleShare obsolete. Another is System 7.0's limit on the number of machines that can access a folder-sharing Mac. Although there's no limit to the number of computers you can hook up to the network, only ten can connect to a

shared folder at a time. (As soon as one user drags the AppleShare icon off the desktop, another user can access the folder.) And because a Mac running System 7.0 can slow to a crawl when several linked computers are accessing its hard-disk drive at the same time (especially when it's launching Apple software), you may find the Macintosh all but unusable during peak sharing periods. But for small group connections, economical file sharing, and limited application launching, System 7.0 is great news for anyone mixing and matching Apple IIGses and Macs.

THE HOME SHARING NETWORK

Be the first on your block to network your home. System 7.0 solves the bridging problem neatly for anyone who has

PhoneNet instead. PhoneNet uses existing phone wiring to route LocalTalk signals between machines, avoiding messy cables through floors or walls.

While you're hooking up the Apple IIGs and Mac, make sure you include your printer in the net. Whether it's an ImageWriter II or a low-cost PostScript laser printer, either machine can call on it when it's involved with AppleTalk.

System 7.0 and AppleTalk let your Macintosh stay a Macintosh, and your Apple IIGs remain an Apple IIGs. There's no mixing of applications, only a sharing of files, information, and data. But because that's what most people want from a network, who's complaining?

NOT JUST FOR SHARING

Although it's a godsend for small-scale file sharing, System 7.0's mission isn't to make Apple IIGs users happy. But it will put a smile on any Mac owner's face.

Among its new features are such things as *TrueType*, Apple's scalable display- and print-font technology. (Instead of storing pictures of letters in various type sizes, this format uses the system file to store the *directions* for drawing each letter.) You'll see smooth type both on screen and on paper, in sizes from one to 32,786 points. No more jagged characters on the monitor, and you get near-laser-quality output even on an ImageWriter II.

Taking a page from the Apple IIGs, the Mac now boasts a simplified font and desk-accessory installation, whereby you simply drag icons into the System folder to add new fonts and DAs. And once application developers begin pumping out System 7.0-friendly software, you'll be able to take advantage of Apple's *publish-and-subscribe*, an automatic cut-and-paste feature in which copied graphics or text is updated in linked documents. You can share a document with others, and when you make changes to your original, the duplicates change, too.

There's more to System 7.0, lots more. *Alias* let you access a file or application from more than one place on your hard-disk drive. Alias icons act like miniature pointers to the real document or application file, so that when you click on an alias, it's as if you clicked on the real thing. You can create an

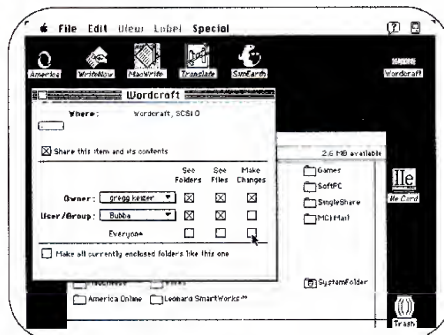


Figure 1. Set access privileges in System 7.0's dialog box.

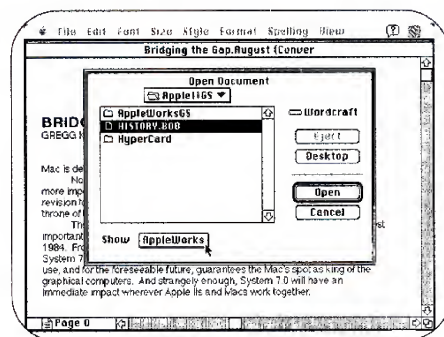


Figure 2. System 7.0 lets you open an AppleWorks file in MacWrite II.

both an Apple IIGs and a Macintosh in the same house.

Assuming you already have the Mac and IIGs, your only extra expense is a pair of **LocalTalk Connector Kits**. If you have the machines in different rooms — the IIGs in the kid's room and the Mac in your home office or den — use Farallon's

alias to represent logging onto an AppleShare volume or accessing another Mac's hard-disk drive, simplifying complex operations to a single mouse click. Further down the road is something called *inter-application communication* (IAC), which will let developers create ways for their programs to share information with, and even work alongside, other applications.

To top it all off, System 7.0 is a bargain. As of July 1, every Mac capable of running System 7.0 will have it pre-installed on the hard-disk drive before it leaves the factory. Earlier Macs can upgrade to System 7.0 in several ways. The least expensive means a trip to a user group or dealer, where you copy the System's eight disks onto your own floppies.

On-line services will also post 7.0 for downloading, though the connect cost will be prohibitive. The smartest method is certainly to plunk down \$99 for the **Personal Upgrade Kit**, which includes the software and two reference manuals. With all its new features, System 7.0 may take some time to learn, and the documentation will help.

Although Senior Editor Paul Statt has said in What's New that the current generation of Mac users doesn't need System 7.0 (see July 1991, p. 14), I disagree. Because of its ability to share files with Apple IIGses, its TrueType font technology, and its alias and publish-and-subscribe features, I think if you own a Mac, you need System 7.0. □

PRODUCT INFORMATION

AppleWorks 3.0, \$249
AppleWorks GS, \$299
MacWrite II, \$249
 Claris Corporation
 5201 Patrick Henry Drive
 Santa Clara, CA 95052-8168
 (408) 727-8227

HyperCard IIGs, \$99
LocalTalk Connector Kit, \$75
System 7.0 Personal Upgrade Kit, \$99
 Apple Computer, Inc.
 20525 Mariani Avenue
 Cupertino, CA 95014
 (800) 776-2333
 (408) 974-1010

PhoneNet
 Farralon Computing
 2000 Powell Street
 Emeryville, CA 94608
 (415) 596-9100
 \$75/connector box



MPD 5¼" DISK DRIVES FOR:

1 Year Warranty Parts & Labor	Apple II, II+, IIe Franklin Ace 1000	\$89.00
100% Compatible Super Quiet	Apple IIc, IIc+, IIGS Apple IIe UniDisk Laser 128	\$99.00
Cable Included	Apple IIc+, IIGS Daisy Chain	\$99.00

**AMR 3½" Disk Drive
For Apple IIc+ & IIGS** **\$199.00**

PRO TERM **\$78.50**

Memory Chips Call

MPD 4 Meg GS Card	
0 Meg	\$59.00
1 Meg	\$114.00
2 Meg	\$169.00
4 Meg	\$279.00

SUPER EXPANDER

IIe 0K to 1 Meg	from \$52.50
IIc 0K to 1 Meg	from \$65.50

GS MOUSE **\$59.00**

SWITCH BOXES

DIN 8 A/B	\$24.95
DIN 8 A/B/C/D	\$29.95
DB 25 A/B	\$24.95
DB 25 A/B/C/D	\$34.95
Parallel A/B	\$24.95
Parallel A/B/C/D	\$34.95

**Extended 80 Column Card
With 64K for Apple IIe**

100% Appleworks
Compatible **\$38.95**
5 Year Warranty

SUPER SERIAL CARD
100% Apple Compatible
5 Year Warranty \$48.95

**Graphics Printer Card w/Cable
For Apple II+ & IIe**

5 Year Warranty Parallel
\$44.95

DISKETTE STORAGE W/Lock

5¼ Holds 70 Disks	\$6.95
5¼ Holds 100 Disks	\$8.95
5¼ Holds 120 Disks	\$10.95
3½ Holds 100 Disks	\$8.95

II+ OWNERS

16K Card	\$34.95
128K Card	\$64.95
80 Column Card	\$48.95
Plus Works	\$49.00
5 Year Warranty	

Prices subject to change without notice.

UNIVERSAL DISK CONTROLLER

Run 800K Disk Drives
on your II+ and IIe
\$64.95

800K DISK DRIVE 3½
for II+, IIe, MAC, LASER 128
\$179.00

**Disk Controller Card
For Apple II, II+ & IIe** **\$34.95**
5 Year Warranty

CPM Card	\$34.95
IIe Numeric Keypad	\$34.95
II+ & IIe RF Modulator	\$15.95

**Cooling Fan for Apple II+ & IIe
With Surge Suppressor** \$26.95

Cooling Fan **\$19.95** **No Noise**
For **Apple IIGS** **Interference**

ACCESSORIES

Mouse Pad	\$4.95
Disk Notcher	\$4.50
Disk Clean 5 ¼	\$4.00
Disk Clean 3½	\$4.00
Mouse Pocket	\$4.95
Amber Monitor	\$99.00

Replacement IIe Keyboard \$55.00	7 Amp. Pwr. Supply II, II+ & IIe \$49.00
--	--

**Joystick for Apple IIe, IIc,
IIc+ & IIGS** **\$24.95**
With Fire Button
Same as Mach III

Cables From.....\$9.95

IIe to Modem	IIc to Modem
IIe to IMG I	IIc to IMG II
IIe to IMG II	Others

**Talk & Data Kits
SCSI Cables**

**GS Power Supply
7 Amp.**

\$69.00

We Ship
2nd Day Air
Continental US Only

VISA & MASTERCARD — NO EXTRA CHARGE
Shipping Most Items \$6.00 / Drives \$8.00 / C.O.D. + \$4.00

MEMORY PLUS DISTRIBUTORS, INC.

505 South 48th Street, Suite #104

Tempe, Arizona 85281
(602) 820-8819

FAX# (602) 968-3211
Serving Apple Users Since 1983

We carry only the
Highest Quality products for
your Apple.
That's why we are
the LARGEST
and
the BEST!

We Ship
2nd Day Air
Continental US Only

9 a.m. to 4 p.m.
M.S.T.
Mon - Fri.

University & School P.O.
Accepted

20% Restocking charge
on returned items

Programs, Peripherals, Phenomenal Prices for Apple & Mac

ACCELERATORS/RAMCARDS

Apple Computer Full Line	
Apple IIe Enhancement Kit	58.
Apple IIe Extended 80 Col. Card	89.
Applied Engineering	
GS-Ram III 1MG	145.
PC Transporter (768K)	257.
PC Transporter Installation Kit GS	39.
PC Transporter Installation Kit IIe	32.
RamWorks III 512K	159.
RamWorks III 1MG	227.
TransWarp Accelerator (GS)	246.
TransWarp Original Accelerator	96.
Z-Ram Ultra 2 512K	227.
Z-Ram Ultra 2 1MG	289.
Z-Ram Ultra 3 1MG	299.
Chips Chips Set 256K 120 or 150 ns	19.
Harris Labs GS Sauce Card "O" K (GS)	73.
GS Sauce 1MG	132.
GS Sauce 2MG	199.
GS Sauce 4MG	339.
Zip Technology Zip Chip 8 MHZ	139.
Zip Chip Model 1600 (GS)	198.
Zip Chip GSX+ (9MHZ/32K)	248.

ACCESSORIES

Apple Computer Apple Mouse IIe	118.
Disk Controller Card	41.
Extended Keyboard ADB	175.
Video Overlay Card	428.
Mac Classic Modulators	CALL
1 MB SIMMS 80 NS	59.
Applied Engineering	
Audio Animator (GS)	163.
Conserver (GS)	74.
Conserver Cable (GS)	16.
High Output Power Supply	74.
II GS Heavy Duty Power Supply	88.
Sonic Blaster (GS)	95.
CH Products Flight Stick	46.
Mac III Joystick	29.
Kalmar	
Kalmar Roll Top 3.5 (holds 45)	14.
Kensington, Inc. AntiGlare Filter GS	37.
Mouseway (Mouse Pad)	8.
Turbo Mouse (Reg. or ADB)	119.
Printer Muffler 80	47.
System Saver (AP Platinum or Beige)	58.
System Saver GS	65.
Universal Printer Stand	19.
Koala Technologies	
Koala Pad Plus w/Graphics Exhibitor	82.
Kraft Floppy Disk Notcher	4.
Maxell Maxell 3.5 DS, DD (10)	14.
Maxell 5.25 DS/DD	9.
Mouse Systems	
Littlemouse APlus or ADB	79.
MousTrak MousePad 7"x9" Size	7.
MousePad 9"x11" Size	8.
RC Systems Double Talk	183.
Ribbons	
ImageWriter Ribbons available in various colors	4.
ImageWriter II-4 Color Ribbon	9.
ImageWriter Rainbow Pack (6 Colors) or (6 Black)	19.
Sony Sony 3.5 DS, DD (10)	12.
Street Electronics Echo II (AP & GS)	99.

APPLE COMPATIBLE COMPUTERS

Apple Computer	
II GS Computer 1MG CPU	799.
Laser Computer Inc.	
Laser 128 800K 3.5" Drive w/ Controller	199.
Laser 128 Computer	CALL
Laser 128 Mouse	44.
Laser 128 System w/Color Monitor	CALL
Laser RGB Monitor	215.

Apple Computer GS/OS v5.0.4 (GS)	39.
Hypercard IIGS	79.
Glenn Bredon	
Prosel 16 w/manual	67.
Central Point Software	
Copy II Plus v9.1	25.
Vitesse, Inc.	
Salvation: Deliverance (GS)	29.
Salvation: Exorcisor (GS)	29.
Salvation: Backup (GS)	29.
Salvation: Renaissance (GS)	29.
Salvation: Supreme Pack	108.
Salvation: Wings (GS)	47.

BUSINESS SOFTWARE

Beagle Brothers AW v3.0 Companion	24.
Clip Art I (GS)	26.

Beagle Bros. Desk Accessories (GS)	36.
Beagle Write	45.
Beagle Write Desk Accessories	
or Font Pack 1 or 2	26.
Beagle Write Font Lib. I (GS)	31.
Beagle Write Picture Manager	25.
Beagle Write (GS)	57.
Outliner for Appleworks 3.0	41.
Timeout Series	CALL
Big Red Software	
Labels, Labels, Labels	22.
Broderbund	
Bank Street Writer Plus (AP or C+)	47.
Claris Apple Works v3.0	168.
Apple Works (GS) v1.1	198.
Intuit Quicken v1.0	37.
Manzanita	
BusinessWorks Bundle AP & GS (Sys. Manager, G/L, A/P, A/R, Inventory)	258.
BusinessWorks Payroll (AP & GS)	109.
Meca Software	
Managing Your Money v4.0 (AP & GS)	98.
Milliken Publishing Medley (GS)	79.
Nolo Press Will Maker v3.0	35.
Seven Hills Software	
Graphicwriter III (GS)	69.
Stone Edge	
DB Master Professional (AP & GS)	179.
Timeworks, Inc. Art Portfolio 4 in 1	69.
Graph It!	43.
People, Places and Things, or Design Ideas	25.
Publish-It v3.0 (AP & GS)	73.
WordPerfect Corp.	
WordPerfect (AP or GS)	104.

COMMUNICATION SOFTWARE

Applied Engineering ReadyLink	57.
Beagle Brothers Point-to-Point	58.
InSync Proterm	79.
Softspoken Crossworks	67.

DISK DRIVES & HARD DISK SUB-SYSTEMS

American Micro Research (Micro Sci)	
A.5 Half Height (II+ & IIE)	129.
A.5 D Half Height 5.25" Drive (IIGS Daisychain)	129.
AMR 800K 1.44 (GS)	168.
GS Partner: Quick 20,40,60 MB	CALL
Apple Computer	
Apple 3.5 Drive (GS & C+)	315.
Apple 3.5 Unidisk	294.
High Speed DMA SCSI Card	105.
Unidisk 3.5 Controller	58.
Applied Engineering AE 3.5" Drive	208.
3.5 1.6MB Disk Drive	249.
AE 5.25" Drive	124.
Controller Card for 3.5" Drive (IIe or II+)	69.
Transdrive 360K Single Drive	184.
Vulcan 20MB (AP or GS)	496.
Vulcan 40MB (AP or GS)	638.
Vulcan 60MB (AP or GS)	1284.
CMS Enhancements	
20 MB w/SCSI II card	459.
30 MB w/SCSI II card	492.
SCSI Rom Upgrade	23.
CV Technologies	
Ramfast SCSI Card w/256K Ram	178.
Laser Computer Inc.	
Laser 128 5.25 Disk Drive	88.
Laser 800KB Drive	168.
Laser 800KB Drive w/controller	199.
Universal Disk Controller	37.

EDUCATIONAL SOFTWARE

A.E.C. Spanish Vocabulary	
or Spanish Grammar	16.
Return of the Dinosaurs	28.
Advanced Idea	
Audubon Wildlife Adventures:	
Grizzly Bears (5.25)	32.
Grizzly Bears (GS)	38.
Whales (5.25)	32.
Whales (GS)	38.
Stars & Planets (GS)	27.
Barron's	
Computer SAT Revised Version	31.
Britannica	
Algebra I: 1st & 2nd Semester	46.
Algebra I: 1st or 2nd Semester	27.
Designasaurus or Revolution (3.5)	27.
Spellicopter	22.
Broderbund Geometry (3.5)	49.
McGee or Katie's Farm (3.5)	24.
McGee Fun at the Fair (3.5)	24.
Playroom	24.

Science Tool Kit Module I or II	25.
Science Tool Kit Master Module	49.
Type!	17.
Carmen Sandiego Series	CALL
Davidson & Associates	
Alge-Blaster Plus (AP or GS)	28.
Math Blaster Plus (AP or GS)	28.
Reading & Me (AP)	25.
Math Blaster Mystery (AP or C+)	29.
Talking Math & Me (GS)	29.
or Talking Reading & Me (GS)	29.
Word Attack Plus (AP or GS)	29.
Grade Busters Corp.	
Grade Busters 1, 2, 3	69.
Learning Company	
Magic Spells (3.5 or 5.25)	25.
or Gertrude's Secrets (3.5)	25.
Math Rabbit (3.5 or 5.25)	24.
Reader Rabbit (3.5)	24.
Talking Reader Rabbit (3.5)	31.
Think Quick (3.5 or 5.25)	29.
or Writer Rabbit (3.5 or 5.25)	29.
Writing and Publishing Center (3.5 or 5.25)	31.
MECC	
Calendar Crafter Home Edition (3.5)	31.
Number Munchers or Word Munchers (3.5 or 5.25)	23.
Oregon Trail (3.5 or 5.25)	24.
Paint with Words (5.25)	24.
USA Geograph (3.5)	49.
or World Geograph (3.5)	49.
Milliken Publishing	
The Story Teller (GS only)	27.
Mindscape Crossword Magic	33.
Orange Cherry Full Line	38 ea.
Queue Kidwriter (5.25)	25.
Kidwriter Gold Edition (3.5)	39.
Sensible Software	
Report Card II (AP & GS)	37.
Sensible Grammar (AP & GS)	59.
Simon & Schuster	
Typing Tutor IV (AP or GS)	26.
Software Toolworks	
Mavis Beacon Typing (3.5)	32.
Terrapin Logo Plus	75.
Weekly Reader/Optimum	
StickyBear Series:	
Full Line Available	CALL

ENTERTAINMENT SOFTWARE

Accolade	
4th & Inches (GS) or Fastbreak	15.
Bubble Ghost (GS)	15.
California	
or European Challenge (GS)	15.
Jack Nicklaus Series	CALL
Test Drive II (GS)	28.
Third Courier (GS)	30.
Artworx Bridge 6.0 (AP or GS)	25.
Britannica Gnarly Golf (GS)	17.
Great Western Shoot-Out (GS)	17.
JigSaw (GS)	17.
Laser Force (GS)	17.
Task Force (GS)	23.
Broderbund Jam Sessions (GS)	30.
VCR Companion	30.
Prince of Persia	22.
ByteWorks Ugly Duckling (GS)	24.
California Dreams Block Out (GS)	23.
Tunnels of Armageddon (GS)	15.
Vegas Gambler (GS)	15.
Casady & Greene Crystal Quest (GS)	19.
Compu-Teach Once Upon a Time	CALL
See the U.S.A.	26.
Electronic Arts	
Bards Tale I or III (AP)	14.
John Madden Football	31.
FTL Dungeon Master (GS)	23.
Leisure Genius Clue, Risk, or Scrabble	26.
Lucasfilm Games Maniac Mansion	15.
Pipe Dream	17.
Micro League Sports	
Micro League Baseball w/General Manager & Stats	24.
Micro Revelations Xenocide (GS)	28.
Microprose F-15 or Pirates	12.
Mindscape	
Balance of Power 1990 (GS)	32.
Hostage (GS)	15.
Captain Blood (GS)	26.
New World Computing Kings Bounty	32.
Might & Magic II	26.
Origin Systems Ultima IV, Ultima V	37.
Ultima Trilogy (I, II & III)	37.

WindWalker (GS)	25.
Ready Soft Space Ace (GS)	33.
Sierra On-LineSlipheed (GS)	21.
Sir-Tech Software	
Wizardry Trilogy (includes I, II, III)	35.
Software Toolworks	
Chessmaster 2100 (GS)	33.
Life and Death (GS)	33.
Spectrum Holobyte	
Solitaire Royale (GS)	22.
Tetris (AP & GS)	23.
Strategic Simulations	
AD&D Champions Krynn	32.
AD&D Pool of Radiance	30.
Curse of the Azure Bond (GS)	33.
War of Lance	26.
SSG Halls of Montezuma (GS)	29.
Pazer Battles (GS)	32.
Reach for the Stars (GS)	28.
Victory Software	
2088: The Cryllan Mission:	
The Second Scenario	35.
2088: The Cryllan Mission (GS)	35.

GRAPHICS PACKAGES

Abacadata	
Architecture Library 1, 2, 3 or 4 (AP or GS)	19.
Design Your Own Home Series	CALL
Baudville 816/Paint	43.
Award Maker Plus (AP & GS)	29.
Beagle Bros. Beagle Draw (GS)	53.
Platinum Paint (GS)	58.
Berkeley Geoworks GEO Publish	58.
GEOS V2.1, GEOCalc or GEOFile	43.
Big Red Software	
PS Lover's Utility Set (3.5)	26.
Broderbund Bannermania (AP or GS)	22.
El Kassir Software COLOR+ (GS)	42.
Supergraphix II (GS)	52.
Roger Wagner	
Graphic Exchange (GS)	29.
Hyper Studio (GS)	82.
Triad Venture	
GDL Graphic Disk Labeler (GS v2.0)	20.
Cliptures or Clipart Plus	20.

MODEMS & MONITORS

Apple Computer	
Apple Color Composite Monitor	309.
Apple GS Color Monitor	454.
Applied Engineering	
DataLink Express (ext. 2400)	158.
DataLink Express w/MNP 5	197.
DataLink Modem 2400B (Int AP & GS)	189.
Supra Corporation SupraModem 2400 (Hayes Compatible)	99.

PRINTER INTERFACES

Apple Computer	
Apple Super Serial Card	105.
Orange Micro Grappler 9 pin	94.
Grappler Plus (AP & GS)	79.
Seven Hills Software	
Independence (GS)	
or Super Convert (GS)	23.
SMT No Slot Clock	29.
Thirdware	
Finger Print GSi verIII	83.
Vitesse, Inc. Harmonie v2.0 (GS)	29.
Xetec Inc. Superwriter 924 (GS, C+, C)	48.

PRINTERS

Apple Computer ImageWriter II	455.
Brother M1109-AP Printer	179.
Laser 190A w/Serial Interface	225.
Seikosha 2000-AP	229.

SCANNERS AND SOFTWARE

Digital Vision ComputerEyes (GS)	186.
Thunderware Lightningscan (GS)	193.
Thunderscan (AP & GS)	148.
Vitesse, Inc. Quickie (AP & GS)	198.
Quickie Update	79.
WestCode Inwords	77.

UTILITIES AND LANGUAGES

ByteWorks	
ORCA C w/Learn to Program	119.
ORCA/DeskTop (GS)	34.
ORCA/C (GS)	79.
ORCA/Design Master (GS)	48.
ORCA/Pascal (GS)	79.
ORCA/Pascal w/Learn to Program	119.
Zedcor ZBasic v4.21	39.

1-800-832-3201

We Sell More Than Anyone Else at the Lowest Prices.

IIGs Products From

Seven Hills Software

GraphicWriter III™

Superior desktop publishing, 1990
inCider/A+ Editors' Choice! 786K.
Programs Plus Price\$69

Disk Access™

With features like Apple's
Finder™ but it's available all
the time as a new desk
accessory! 128K.

Programs Plus Price\$27

Font Factory GS™

Resizes fonts, creates special
symbols, improves print quality
from your programs. "...clearly
the Cadillac of the field." —
inCider/A+. 768K.

Programs Plus Price\$22

SYSTEM

Package Apple IIGs
Ram 1 MB
Monitor 12" Apple RGB
Drive 3.5 Superdrive
Harddrive 20 MB
Keyboard/Mouse

PRICE \$1999

SYSTEM

Package Mac Classic
Ram 2 MB
Monitor 9" Built In
Drive 3.5 Superdrive
Harddrive 40 MB
Keyboard/Mouse

PRICE \$1330

SYSTEM

Package Mac LC
Ram 2 MB
Monitor 12" Apple RGB
Drive 3.5 Superdrive
Harddrive 40 MB
Keyboard/Mouse

PRICE \$2399

SYSTEM

Package Mac IISI
Ram 5 MB
Monitor 13" Apple RGB
Drive 3.5 Superdrive
Harddrive 80 MB
Keyboard/Mouse

PRICE \$4899

SYSTEM

Package Mac IISI
Ram 3 MB
Monitor 13" Apple RGB
Drive 3.5 Superdrive
Harddrive 80 MB
Keyboard/Mouse
Nubus Adapter

PRICE \$4399

EDUCATION

READER RABBIT
MATH RABBIT
KID PIX
MIN. MAC PAINT
TETRIS
ADOBE TYPE MANAGER
WHERE IS CARMEN
SANDIEGO (CHOICE)
VIREX
MICROSOFT WORKS

\$499

HOME

VETTE
TURBOTAX
WILL MAKER
SUPERPAINT
TETRIS
ADOBE TYPE MANAGER
MY LABEL MAKER
MY MAIL LIST
VIREX
MICROSOFT WORKS

\$599



HOME DESIGNER'S DREAM

Design Your Own Home Architecture, Landscape or Interiors by Abracadata. Now you can have a designer home with a most prestigious name: yours. Draw floor plans, elevations, structural details the way you want them. Build interior and landscape designs with separate packages. All packages come with pre-drawn shapes.

Programs Plus PriceCALL

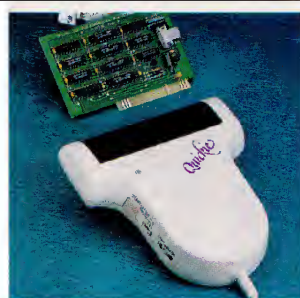
BUSINESS

QUARK EXPRESS
QUICKEN
HYPER CARD KIT
ADOBE TYPE MANAGER
VIREX
MICROSOFT WORKS

\$860

PRINTERS

IMAGewriter II
\$499
HP DESKWRITER
\$699
PERSONAL LASERWRITER
\$1025
LASERWRITER II NT
\$3699
LASERWRITER II NTX
\$4825



QUICKIE - FIRST HAND SCANNER FOR YOUR APPLE II COMPUTER BY VITESSE, INC.

Allows you to scan in true grey or B&W, 320/640 mode. Features include Landscape/Portrait Scan, cut/paste, open multiple windows, fat bits edit, resize, rotate, flip, direct print, save to six formats, NDA and MORE! ONLY scanner that's InWords OCR Software compatible.

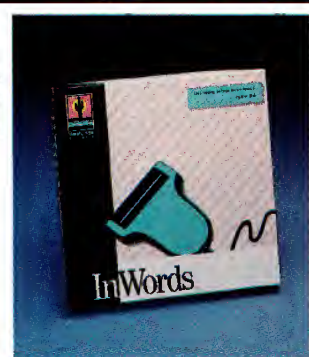
Suggested Retail\$299.

Programs Plus Price\$198.

GRAPHICS

MAC DRAW II
MAC WRITE II
PAINT II
ADOBE TYPE MANAGER
VIREX
MICROSOFT WORKS

\$599



TEXT SCANNING SOFTWARE

InWords by WestCode is OCR software for the Apple IIe and IIGs. With InWords and a hand-held scanner, you can scan in virtually any printed information - articles, books, contracts, lesson plans, and more - into a file for your word processor, data base, spreadsheet or desktop publishing program. Scans up to 500 words per minute. Requires 512K and Quickie.

Suggested Retail\$129

Programs Plus Price\$77

SCANNERS

THUNDERSCAN/WORKS
\$199
COMPUTEREYES MAC II
\$320
LIGHTING SCAN 400
\$357

MEMORY

1 MB
\$55
3 MB CL
\$150

MODEMS

DATALINK MAC PORTABLE
\$199
ORCHID FAX MODEM MAC
\$377
PROMODEM 2400 MINIFAX
\$209
PROMODEM 9600 PLUS FAX
\$749
SUPERMODEM 2400
\$99

APPLE POLICIES

1. VISA, MASTERCARD or DISCOVER accepted. Your card is not charged until we ship.
2. If we send a partial order, there's no second shipment charge.
3. All shipments insured at no extra charge. No tax on out of state orders.
4. COD maximum, \$1,000 cash or certified check.
5. No software refunds, 30 day return on defective items and will be replaced with same item only, no shipping, handling or insurance refunds.
6. Absolutely no returns without prior authorization.
7. Repackaging fees will be charged on items returned damaged or incomplete condition.
8. Prices subject to change without notice. All items subject to availability.
9. Corporate and school purchases accepted, based on credit approval.

SHIPPING

- We ship via UPS, DHL, US Mail. Saturday deliveries available.
- Mail in orders, furnish telephone and/or fax.

PROGRAMS
PLUS

FAX: 203/381-9043

Inquiries: 203/378-3662

Canada: 1/800/344-7753

75 RESEARCH DRIVE

STRATFORD, CT 06497

1/800/832-3201

REVIEWS



DESIGN YOUR OWN RAILROAD

ABRACADATA, LTD.

P.O. Box 2440, Eugene, OR 97402, (800) 451-4871, or (503) 342-3030

Computer-aided railroad-design program; 64K Apple II Plus or later with mouse, paddles, or joystick; 1-megabyte Macintosh version available later this year; printer optional; copy protection; \$49.95



For many Americans, railroads are a source of endless fascination. It's difficult not to be moved by the sight of a full-blown freight train in motion. The scream of the whistle and the clack of the wheels call up visions of a time when America was headed west on steel rails, with a full tank of water and a boilerload of coal.

If you've ever had the urge to don a railroad engineer's cap and couple a tender (a vehicle for carrying fuel and water) to a locomotive, Design Your Own Railroad

could make your dreams come true. Ride the rails as your train barrels through deep, cavernous tunnels or keep a watchful eye from the caboose as an old steam engine chugs over a precarious trestle bridge. Design Your Own Railroad has everything you need to stay on track.

This software consists of two programs in one package. The first application provides computer-aided-design (CAD) tools for crafting precision model-railroad layouts. The second incorporates seven

railroad games and lets you run trains over layouts you've created. You can monitor scheduling demands; complete reports; manage speed, direction, switching, and coupling; and devise strategies to make the train arrive on time.

The software requires only 64K to run, making it suitable for even an Apple II Plus. Because the model trains you put together navigate their routes on screen, rather than on a plywood layout, you save space as well as dollars. You don't need to purchase expensive track, rolling stock, or paraphernalia such as miniature figures, buildings, and landscaping. And with the action taking place on screen, you don't have to worry about maintenance chores such as cleaning track or repairing faulty electrical components. If you're really into plywood design, though, use this program to experiment with "what if" scenarios before you actually lay down any track.

Model-train engineers can even create tracks with curves and switches, using metric or foot/inch measurements (in decimal notation). The program also features a library of 200 curve arcs customized to standard train scales, such as Z, N, HO, S, O, and G, as well as bridges, scenery, overpasses, tunnels, and mountains. You can choose from more than six different area configurations with scales ranging from *one-thirty-second of an inch = 1 foot* to *1 inch = 1 foot*. When I used the HO gauge and the scale *one-eighth inch = 1 foot* to print the sample file, the layout measured 31 by 17 feet.

Pull-down menus make layout design and construction easy, and there's a special tool that automatically places dimension lines (lines with arrows at each end and a measurement in the center) where you specify. Cut, copy, and move functions erase or replicate selected portions of the screen. Text tools let you enter small or large horizontal and vertical type on screen to label buildings, specify industrial sites, or define geographical

elements. You can draw arcs freehand with the sketch option; other drawing tools let you put personalized illustrations on cars.

Destinations such as a slaughterhouse, a perfume factory, a logging mill, or a recycling plant complete your layout. Then you can select up to 16 cars from a rolling-stock library that includes passenger coaches, sleeping cars, hoppers, freight cars, early or late steam locomotives, diesel locomotives, and cabooses. Freight can include automobiles, beer, canned goods, chemicals, textiles, wood chips, or any of 26 other choices. Define your cargo, hitch cars together, blow the whistle, and chug that choo-choo.

While the train is running, you can couple, uncouple, switch cars, zoom in on a specific car for a close-up, keep track of all rolling stock on track, and lots more. The success of your railroad simulation depends in part on how you handle typical railroading tasks. This ability also helps the train reach its final destination on schedule.

Don't expect to become a whiz-bang train engineer overnight. *Abracadata* refers to *Design Your Own Railroad* as a "railroad simulation processor" — like a word processor, the program is a toolkit with endless potential, rather than an end in itself. Creating precision layouts that actually work takes patience and experience. Even the games require time to master.

MORE BITE THAN CHOO

This combination CAD-and-railroad-simulation package adds a new dimension to conventional model railroading, but it's far from perfect. If IIGS users want to read the small print used in switch settings, they'll have to set display to monochrome; to keep trains on track at fast speeds, they'll need to configure system speed to normal.

You can't install the program on your hard-disk drive, nor can you launch it from the GS/OS Finder because it uses a DOS 3.3-compatible operating system called *Diversi-DOS*, which GS/OS doesn't recognize. This incompatibility wouldn't be so annoying if disk operations weren't so cumbersome. Boot the flip side of a *Design Your Own Railroad* 5.25-inch program disk and a menu with three options (*Operations*, *Select Rolling Stock Graphics*, *Catalog Data Disk*) appears. If you choose the second item, *Select Rolling Stock Graphics*,

the program requests that you type a file name. If you don't remember it, you'll have to exit the option and select the third choice, *Catalog*. By today's user-friendly computing standards, this command-line interface is simply archaic.

While the software gives you an opportunity to generate hardcopies of pictures and train layouts, the printer-installation interface is awkward. To install a new printer, you must scroll through a list of 25 hardware options, remember the number that corresponds to your system's printer, then enter that number once the list has finished scrolling. You follow a similar installation procedure for the printer-interface card. Be sure to consult the chapter on printer installation in the manual, or you may end up configuring the printer settings incorrectly.

The CAD program offers pull-down menus, but minimal keyboard command equivalents. Selecting *Quit* from the *File* menu returns you to the mouse-configuration screen *Mouse or Paddles?* (*M/P*), instead of truly exiting. *Precision Layout* designs have a flat, two-dimensional text-based appearance, instead of the 3-D look and feel you get with the *Operations* module. To save your *Precision Layout* designs and *Operations* layouts, you must have properly formatted data disks on hand; the software won't let you initialize disks within the program. Be sure to keep several formatted blank disks by your side, just in case.

The 200-page manual has no index for quick reference, and novices may find the instructions difficult to follow because there are relatively few screen dumps to illustrate instructions outlined in the text. The manual does include a delightful collection of historical pictures and drawings, though. Finally, there's no description of the icons that run down the right side of the *Operations* screen.

ALL ABOARD

Design Your Own Railroad combines the fun of model-railroad operation with the convenience of an electronic desktop. You can use it as a toy to re-create a favorite layout you had as a kid, take advantage of its powerful design tools to simulate "what if" scenarios for an actual transit system, or snatch a few moments

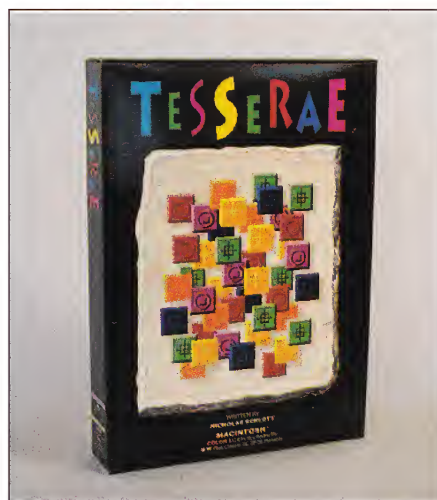
from your busy schedule to meet the challenges of its many games. Once you get used to its awkward interface, this software may be the only excuse you need to get back into "training."

Carol S. Holzberg, Ph.D.
Shutesbury, MA

TESSERAÉ

INLINE DESIGN
5 WEST MOUNTAIN ROAD, SHARON, CT 06069,
(203) 364-0063

Strategy board game: 1-megabyte Macintosh
Plus or later; color supported; \$49.95



Tesseræ: The perfect escape.

Arcade or strategy — is this the eternal question? Arcade-like action has a lot to offer. Fast-paced antics keep you on the move. Realistic sound effects and colorful animated graphics images make a game come alive. But some gamers tire quickly of the simple-minded "thrill and kill" genre, because the action is too repetitive. Games more concerned with beating the clock than with plotting battlefield strategies usually lose their appeal.

Enter *Tesseræ* (from the Latin word meaning *cube*, or *die*). This single-player strategy game for the Macintosh has all the markings of good software entertainment. It features three levels of difficulty, nine mosaic (game-board) layouts, plus rich animated graphics images (even on black-and-white screens). In a standard game, players choose a board mosaic by clicking on its icon. In tournament mode,

Continued on p. 66



The ELECTRONIC PALETTE

With pixels as your medium and the mouse as your tool,
Mac and GS paint programs help you discover the artist within.

By CYNTHIA E. FIELD, Ph.D. * CONTRIBUTING EDITOR

Let your visual imagination run wild — a good paint program and a graphics-smart computer like the Apple IIGs or the Mac LC can put the fun back into creating. How? Besides providing electronic versions of traditional art tools such as the sketchpad, the palette, and the brush (and a host of unique tools, as well), paint programs offer one extraordinary feature, unlike anything you can buy in a graphics-supply store: a host of editing, save, and undo options that let you alter any part of your image, at any stage, neatly, simply, and easily. Just as your word processor can help you overcome writer's block, a paint program helps you conquer your fear of "the empty canvas."

ARTIST'S CHOICE

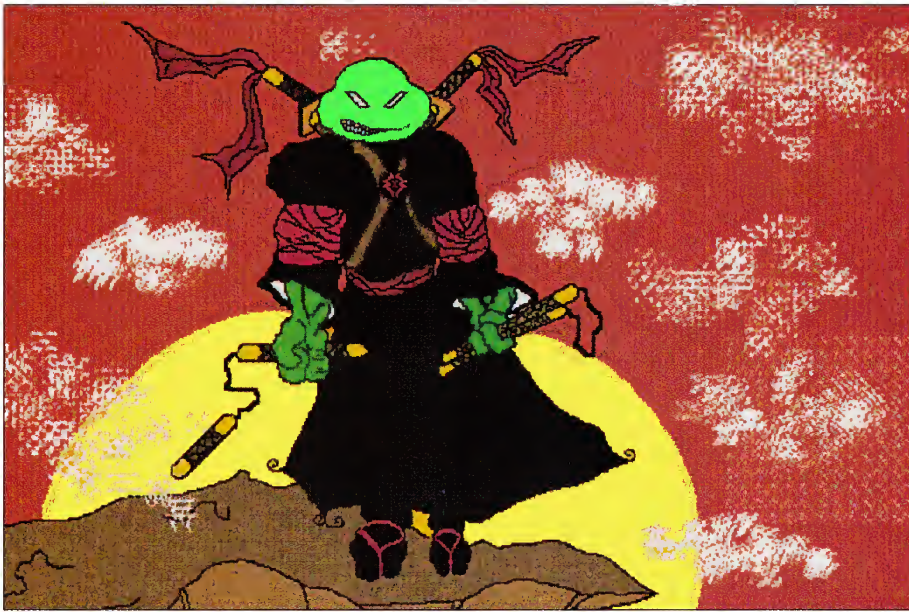
Let's take a look at five popular low-cost art programs: **Amazing Paint**, **Color MacCheese**, **Easy Color Paint**, **MacPaint**, and **Platinum Paint**. (See the accompanying sidebar, "For Kids — and Kids at Heart," for a run-down on three children's packages for the GS and the Mac.) Although each product is unique in certain respects (see the accompanying "Portraits in Miniature" for details), most Mac and GS paint programs have much in common. For one thing, they all exhibit Apple's "Human Interface" standard, with easy-to-use pull-down menus, dialog boxes, and mouse input (with more-

or-less standardized alternate keyboard commands for the power artists among you).

Each program offers a well-stocked toolkit, with both traditional and New Age paint options packaged in a movable palette. (For example, MacPaint, for 512K Macintoshes, lets you "tear off" the tool palette from the menu bar much as you would a piece of notepaper from a pad. Drag the palette to the screen location you like best and, when it's time to admire a completed painting, click on the tool window's close box to prevent the palette from obstructing your view.) Each tool palette sports icons symbolizing the art supplies you need to create an unlimited variety of images — anything from landscape paintings to flow charts to school insignias, company logos, and hi-tech doodles.

A choice of a dozen or more brush shapes isn't uncommon, and with a full-featured program such as Platinum Paint (1-megabyte GSeS) you can even create custom brushes from virtually anything you design, including digitized or scanned images you've imported. "Brushifying" is a lot like rubber-stamping, or placing stickers on a piece of paper.

For precise detailing, your paint program's pencil tool and zoom feature are unparalleled. Some products, Easy Color Paint (1-megabyte Macs) among them, add a magnifying-glass icon to the tool chest, while



An outstanding collection of features, including predefined color palettes, a 70-item pattern palette, and a bonus "Hi-Tech Coloring Book," makes Creative Software's Easy Color Paint for the Mac an exceptional bargain. Painting above by Randy Marks.

other programs, including Color MacCheese (1-megabyte Macs), display magnification buttons such as "2X," which doubles the size of selected areas of your work. Amazing Paint (512K Macs), offering both a magnifying-glass icon and boxed symbols, can enlarge your image some 800 percent.

SHAPING UP

In addition to intuitive tools such as brushes, pencils, and magnifying glasses, paint programs also offer tools that automatically create hollow or filled, framed or borderless geometric primitives. Simply click on the round-rectangle icon, for instance, and "rubber-band" the shape by pressing the mouse button while you drag.

Creating custom polygons as well as arcs and lines (a half-dozen line thicknesses are usually offered) is also as easy as selecting the appropriate icon from the tool palette. Use the shift key whenever you want to constrain a shape: The oval tool will construct a near-perfect circle, the rectangle tool a near-perfect square, and so on.

All paint programs offer at least two colors — black and white — and a series of patterns, as well. MacPaint and Amazing Paint are purely black-and-white programs, but are nevertheless ideal for designing many kinds of graphics — from a mock-up of a commercial advertisement to a deco-

orative "pen-and-ink" sketch for your 1991 holiday greeting card. Using the assortment of gray-scale patterns provided with these programs widens your creative options further. Incorporate some stylized text — all programs support standard Mac or GS fonts — to complete your project.

ELECTRONIC CRAYONS

True to their names, most paint programs offer more colors than a box of Crayolas. Multicolored patterns are standard with these products, as well, and virtually all let you create custom color patterns if you like.

Generally speaking, each paint palette displays 16 colors at a time from a cast of thousands. Programs like Platinum Paint let you create 16-color custom palettes from the 4096 hues generated by GS systems. Easy Color Paint's 256-color Mac palette will spoil you, though. With additional memory on the Mac LC, you can sample Color MacCheese's 32-bit graphics palette and "millions" of colors, but you might just be contented with the countless options offered by the program's color wheel.

In the GS/Mac art world, paint is never in short supply, and applying it is never a problem, either. Besides a multitude of brushes, try the paint-can and airbrush tools to add pizzazz to your creations. The paint can fills a designated area with a

specific pattern, color, or gradient. The airbrush (which looks like a can of spray paint) spews and splatters paint on your canvas according to the nozzle size and spray rate you choose.

Picking colors from the paint palette is a snap — just click to "dip" your brush or other paint tool on the desired color swatch. Paint palettes, like their tool-palette counterparts, often take the form of windows you can move around the screen. Sometimes paint palettes are pull-downs or pop-ups instead.

Replicating a color you used previously in a painting is easy if your paint program offers an eye-dropper tool; click it on the section of canvas displaying the color you want to use. It's a lot easier than using a paint palette — particularly when the palette's composed of hundreds of colors.

Besides letting you store your creations in standard formats on a data disk, color programs such as Easy Color Paint let you make hardcopies of your paintings on a color-capable printer like Apple's ImageWriter II. The washed-out quality of printed paintings doesn't compare to their original screen appearance, though, so you might want to consider other ways of showing off your work. Two possibilities come to mind: recording your art gallery on videotape directly from the computer screen or incorporating your creations into hypermedia stacks.

Sometimes the canvas size you choose is larger than the monitor's screen. Moving around an outsized painting like that is pretty easy, thanks to scroll bars or the "grabber" tool (which looks like a pudgy human hand). Most programs elicit automatic scrolling when the tool you're using "bumps" into the paint window's boundaries.

Within memory limits, programs such as MacPaint let you work on as many as nine paintings at one time. Switching from one window to another — for comparison purposes or just for diversion — is as easy as pulling down the *Goodies* menu and selecting the artwork you want to view.

FINISHING TOUCHES

Editing a traditional painting is at best an untidy proposition. Unless you enjoy piling on paint and scraping it off, art in the "real world" is pretty much a done

deal. (Try fixing up a painting that's partially or completely dry and you'll see what we mean.) With a computer paint program, easy-to-use editing tools abound. And you can invoke them today, next week, or next year.

Let's say you've painted an avocado on the right-hand side of a still life and then decided the fruit would look better on the left. In the real world, you're out of luck unless viewers plan to admire a reflection of your masterpiece in a mirror. It's no problem with digital artwork, though. Begin by selecting the avocado with either the *marquée* or the *lasso* tool. The *marquée* picks up rectangular areas, while the *lasso* shrink-wraps oddly shaped selections.

Notice how we've avoided the word "object" in describing the avocado in our hypothetical still life? In "computerese" an *object* is a graphics element that's created with a drawing program. Objects differ substantially from *bit-mapped* designs created with paint programs like the ones we're talking about here.

Objects are like modular pieces of a drawing, which your Apple constructs from mathematical formulas. You can click on an object, pick it up, and move it around. Significantly, you can layer objects without erasing any objects that lie underneath. Not so with painted creations. They're plotted within a grid of picture elements (*pixels*) arranged in a single layer on your computer screen. Paint a purple pixel green and that purple pixel is history.

While there are probably as many ways to rearrange parts of your bit-mapped still life as there are artistic styles, the easiest may be to select the avocado with your program's *lasso* and drag the fruit to its new destination. This action, however, leaves a white splotch on the canvas where the fruit appeared originally. If the still life's background is simple, you can use the paint-can tool to fill in color. If the backdrop's somewhat more elaborate, however, you'll want to employ special features, such as Platinum Paint's shading, blending, and smoothing options, as well.

Virtually all paint programs have the ability to flip, stretch, and shrink selections. In addition, while most programs restrict rotation to 90-degree increments, Amazing Paint lets you rotate selections freely. *Marquée* the avocado, pull down the *Effects* menu, and choose *Free Rotate*. Tug the corner handles appearing on the selection's frame until you get just the effect you want.

With paint programs like the ones featured here, even your failed attempts won't clutter up your studio. Whenever you want, you can start fresh with a new canvas: Clear the screen or open a new document. You can fix minor bloopers with the indispensable *Undo* command or the eraser tool. If you're working in MacPaint, use the program's *Snapshot* option for bigger blunders, or "revert" to the previously saved version of your masterpiece-in-progress.

Whether you're searching for a new recreational pursuit, a hi-tech medium in which to develop your professional talents, or new inspiration for your fine-arts class, take time to explore the world of computer painting. With a boost from a low-cost graphics package, your GS or Mac can transcend the world of mere productivity to become a vehicle for creativity, as well. A paint program can give you back the freedom to play.

PORTRAITS IN MINIATURE

AMAZING PAINT 1.01

Despite its exclusively black-and-white graphics capability, CE Software's Amazing Paint is a surprisingly full-featured Mac graphics program.

Among the software's noteworthy attractions is a dynamic three-column "equipment palette." The first two columns comprise the "tools panel," featuring customary implements such as the paintbrush, pencil, hand, paint can, magnifier, airbrush, and assorted geometric shapes.

In addition to a *marquée* and a *lasso*, Amazing Paint also provides two special selection tools: a shape selector for demarcating an area with one of the program's 36 built-in shapes (or a shape created on the fly) and a unique "wand" for capturing interior spaces within enclosed areas.

The third column in the equipment palette represents the "action panel," which changes to reflect options available for a selected tool. When you click on the spray can, for instance, the program's action panel lets you choose among dozens of patterns, shapes, and speeds as well as opaque, transparent, inverted, and "eraser" inks.

Here's an extra benefit: Amazing Paint's tidy action panel makes the program screen one of the least cluttered we've seen. For maximum convenience, everything's available at the click of a mouse.

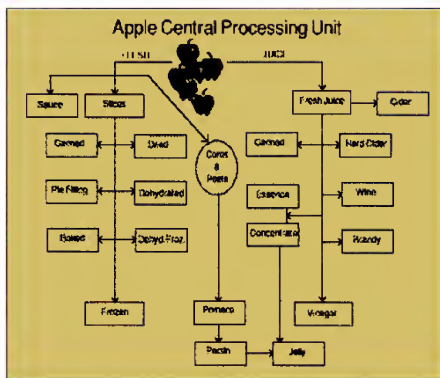
The program's unique multiple-undo capability lets you back up — not just one step, but two, three, or more; magnification buttons enlarge your work 2X, 4X, or 8X, or even reduce it to one-half or one-third.

If your Mac has sufficient memory, you can work with as many as eight paintings at a time. A singular "billboard mode" printing feature lets you create large multipage posters, with or without crop marks for ease of assembly.

Among other "amazing" features are the program's automatic, customizable arrowheads on lines; three dozen eraser shapes for ease of editing; user-defined corners on round rectangles; and a generously illustrated, spiral-bound



Concert flier created with CE Software's Amazing Paint for the Mac. It's black-and-white only, yet offers a substantial number of tools and effects, including free rotation and 36 built-in shapes.



Flow charts are a snap with **Baseline's Color MacCheese for the Mac**, thanks to a coordinates window for precision projects.

manual that's less than a quarter-inch thick and quite a pleasure to read.

COLOR MACCHEESE 2.0.5

Without question the most colorful paint program evaluated here, Baseline Publishing's Color MacCheese for the Macintosh (reviewed in July 1991, p. 30) may well be the most memory intensive, as well — if you plan to exploit all its features, that is. As the program's sometimes flip-pant, sometimes entertaining (but sometimes sketchy) manual asserts, "A minimum of 2 megabytes is recommended and more is better."

The reason? Color MacCheese supports true 32-bit graphics with millions of possible color choices. Fortunately for the rest of us, Color MacCheese also helps you set preferences for color choice,

canvas size, and screen display based on the amount of random-access memory available in your Macintosh.

The program's flotilla of "floating windows" includes a tools area with its cache of ordinary items, such as brushes and a pencil, and extraordinary ones such as an eyedropper, a rake tool, a water-drop tool, and a transmogrifier.

The context-sensitive help window is a MacCheese exclusive. Move the mouse over a tool or other screen item and the window provides pertinent information. Point to the transmogrifier, for instance, and the help window tells you that this tool adds texture, and suggests double-clicking on it to set size and flow.

FOR KIDS — AND KIDS AT HEART

Before you let your kids share in the fun, reawaken the child inside yourself with **Color 'n' Canvas**, a top-notch GS paint program for elementary-school children published by Wings for Learning, an affiliate of Sunburst Communications; **My Paint**, a "no words" GS package for kids aged 4 to 8, from Saddleback Graphics; and **Kid Pix**, a wildly entertaining new paint program for the Mac from Broderbund Software. Color 'n' Canvas and Kid Pix let you print masterpieces in color on an ImageWriter II; you'll get wonderful refrigerator art in color with My Paint, too, but you'll have to print it via another GS paint program.

COLOR YOUR WORLD

Designed primarily for schools, Color 'n' Canvas (reviewed in January 1991, p. 86) features seven easy-to-understand pull-down menus, a tools bar with items such as brushes, geometric shapes, a paint can, a text tool, an eraser, a cut-and-paste (or marquée) tool, a hand tool, a magnification tool, and a prominent undo button. Although there's no airbrush tool, you can easily create a custom brush to simulate a spray can. Some unexpectedly advanced features include a choice of grid settings (or no grid) and nine possible brush

mirrors. Grids are composed of invisible, magnetic lines that help you align your work. Mirrors let you draw brush strokes that radiate simultaneously in various directions.

To make things easier for young artists, Color 'n' Canvas uses nonstandard mouse movements. In other programs, drawing a line means holding down the mouse button while dragging the mouse from the line's origin to its terminus and then releasing the button. With Color 'n' Canvas, you click to begin the line and click when it's finished. Instead of "rubberbanding," you click-drag-click.

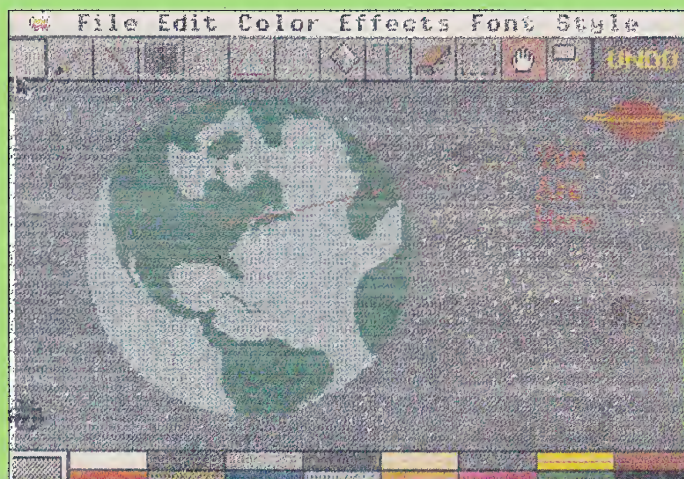
A color bar at the bottom of the screen provides 16 hues, based on a default palette derived from the traditional RYB (red/yellow/blue) color wheel. Teachers can opt to use the RGB (red/green/blue) color editor instead. A unique Color 'n' Canvas feature lets the teacher design temporary or permanent backgrounds on which children build their paintings. Another unique feature is the program's ability to format data disks.

Color 'n' Canvas includes an assortment of options for teachers, such as disabling the program's brush-editing feature. Like all Sunburst products, Color 'n' Canvas comes with a host of lesson ideas and reproducible classroom worksheets.

ELECTRONIC FINGERPAINTING

My Paint features animated icons, musical colors, flashing paints, and talking pictures. Youngsters can draw and paint their own, or brighten up one of 28 black-line graphics included on disk. There are 10 colors from which to choose, each with its own associated sound. If you point-and-click on the colors in just the right order, you can even play a simple tune, such as *Twinkle, Twinkle, Little Star*.

There are no words to read or keyboard commands to enter. Kids simply point-and-click on animated icons in a menu bar at the top of the screen. The eight paint-tool icons include two freehand brushes (one, thick, one thin), each painting in a hue selected from the 10-color palette running down the right side of the screen. A third tool works in tandem with either brush to paint freehand strokes in a series of six colors (orange, yellow, green, blue, pink, and red).



Screen dump: **Wings for Learning's Color 'n' Canvas for the GS** offers plenty of advanced features in an easy interface.

For precision paint jobs, a special window displays x,y coordinates, indicating the actual location of the mouse with respect to the origin (the upper left-hand corner of the document), and delta coordinates, representing the distance you've dragged the mouse.

Most Mac LC artists will want to display the program's 24-color handy palette as well as the gorgeous color wheel with countless more possibilities.

Scroll to the end of the patterns palette to view the program's rich assortment of black-and-white and multicolor designs — and its digitized images of famous

Magazine logo in Easy Color Paint for the Mac, dithered for ImageWriter II.



My Paint's arsenal is limited compared with the array you'll find in Color 'n' Canvas, yet it still gives children the chance to experiment with colors and special effects. Clicking on the mirror icon, for example, directs the program to replicate a paint stroke both horizontally and vertically. When the mirror's "on," the brush paints four images instead of one. The program's "fill-'em-up" icon is another useful special-effects tool. It encourages kids to draw an outline, then fill it with color. The outlined area must be completely enclosed or bordered by other areas of color for fill-'em-up to work; if there are any gaps in the border surrounding the outline, fill-'em-up will spill paint beyond the outline's boundary.

Clicking on the menu bar's flashing-colors icon activates the program's most interesting special-effects tool. When this one's "on," images painted in the drawing window change hues rapidly, like color cycling. Elements painted with the color brush take on a neon-sign quality as they simulate a rippling movement.

Click on the disk icon and you'll see a new menu with big blue and red arrows. Every mouse click on an arrow calls up another of the program's 28 line-art drawings. When youngsters see a picture they want to color, they just click on it to select it, and the color palette reappears.

Each drawing has an associated audio effect, as well: Click on the mouth icon and the brontosaurus growls, the kitty meows, the duck quacks, and so on.

My Paint succeeds because it's not just an ordinary paint package. Its innovative approach to electronic painting shines through from the moment the program first appears on screen. Animated icons, flashing colors, digitized speech, and a user-friendly interface combine to make the product both easy to use and lots of fun. "It's totally awesome, dude!" exclaimed my 7-year-old helper. I couldn't agree with her more.

NOT FOR KIDS ONLY

Kid Pix is a blast! Sure, it offers honest-to-goodness paint tools such as assorted brushes, familiar geometric shapes,

and a 36-color paint palette. Some tools — the paint bucket, for one — look like standard adult fare. But others, such as the stubby pencil and the moving-van marquee, win thumbs-up for cuteness. Throw in a couple of "unique" paint tools, such as the electric mixer and rubber stamps, and you get the picture: Kid Pix is a pure delight!

So delightful, in fact, that the program's paint tools make sounds — and sometimes they even talk. Click on the undo guy, and, if he's not making boinking sounds, he's blurring out an "Oops" or an "Oh, no!" Listen to paint gurgle or hear the letters of the alphabet sounded out by real folks speaking English or Spanish. Try clicking on the text tool and "playing" some letters, numbers, and selected punctuation marks just as you would musical notes on a piano keyboard.

Kid Pix's wacky brushes are well named. Try the bubbly-brush option: It looks and sounds like bubbles you blow in the bathtub (okay — bubbles you used to blow in the bathtub). The galaxy brush option plinks down a random assortment of stars, while the alphabet line sounds like a manual typewriter. There's even a crazy connect-the-dots brush to help you design custom dot-to-dot pictures.

Kid Pix can import other Macintosh files, including clip art, digitized photos, and Print Shop graphics as well as pictures created with some of the adult paint programs reviewed in the accompanying article. Kids will relish livening up your artwork with Kid Pix stickers and funny brushes. If you have a Mac LC or IIsi (or a Macintosh equipped with the **MacRecorder** digitizer card-plus-software sound system from Farallon Computing), you can even incorporate real-time sounds into your paint files. As we said in our June 1991 issue (Editors' Choice, p. 80), Kid Pix is "the best paint program you've ever heard."

— Cynthia E. Field and Carol S. Holzberg



Broderbund's Kid Pix for the Mac: the best paint program you've ever heard.

personalities. If you've been wondering where "The King" will appear next, we've got the answer — he's been immortalized in the Color MacCheese pattern window!

EASY COLOR PAINT 2.0

If you're looking for an economically priced, one-size-fits-all paint program for the Macintosh at home or at school, look no further than Creative Software's Easy Color Paint. The software comes with four ready-made preference files (*Intro*, *Junior*, *Standard*, and *Artist*) and a series of user-selectable options to help you configure the software to suit your needs. You can experiment freely with virtually all settings without restarting your Mac.

For example, the *Artist* level paint palette displays dozens of colors at one time, but the paint chips are so tiny that it might be difficult for very small children or visually impaired adults to select colors or to discern subtle differences among them. Paint swatches in the 256-color *Standard* palette are larger, and those in the 16-color palettes are the largest of all.

Children will enjoy the program's accompanying *Hi-Tech Coloring Book*, which contains dozens of ready-to-fill pictures on disk. We can't think of a better way for elementary-school kids to earn computer "bragging rights" than to embellish one of these drawings and print it on an ImageWriter II.

When you're ready to create original artwork, Easy Color Paint provides the tools you need. When you click on certain



Easy Color Paint offers selectable options for individual configuration. Electronic "sampler" above by Kjersti Ehrie.

items in the program's *Tools* pull-down menu or the skinny-tools palette, the program's menu bar changes accordingly. For example, clicking on the eraser creates a special menu you pull down to alter that tool's size.

More than a dozen predefined color palettes and various gradient fill modes are available in Easy Color Paint. There's also a "triangle-plus" tool for drawing special geometric shapes such as crosses, diamonds, and wedges.

In addition, the program's pull-down pattern palette provides more than 70 ready-made black-and-white and multi-color patterns. Like some of its pricier competitors, Easy Color Paint even lets you choose degree of roundness on the corners of round rectangles.

Easy Color Paint lacks a few of the usual popular features — free rotation, for one — and the program's spelling of *marquée* (*m-a-r-k-e-e*) is a little disconcerting. Despite these minor gripes, though, Easy Color Paint offers a stable of features we consider outstanding for a program costing so little.

MACPAINT 2.0

Although it displays in black-and-white only,

Claris Corporation's MacPaint program is a respected standard bearer among software products for Apple computers. The program supports up to nine movable, resizable document windows.

Myriad tool options include, among other things, multiple brush sizes and shapes, a ready-made (but editable) pattern palette, assorted type styles, and special alignment controls, including both text justification and line leading.

Unlike most commercial paint programs in its class, MacPaint sports a mouse-position window displaying not only *x,y* and delta coordinates, but also distance in inches, centimeters, or pixels.

In addition to the usual undo and revert-to-saved features, MacPaint offers a unique *Take Snapshot* command that lets you save a backup copy of your painting in the computer's memory. If you make a series of changes you'd later like to discard, recall the snapshot by choosing *Revert to Snapshot* from the *Edit* pull-down menu.

Another MacPaint-specific feature is the program's ability to save files as "stationery templates." The MacPaint user's guide compares stationery files to pads of preprinted forms. Each template contains text and artwork you use frequently and opens as an untitled document — a safety valve that precludes the likelihood of erasing the original template on your data disk.

MacPaint may lack advanced features such as custom brush shapes, editable spray-can nozzles, and free rotation, but

m a r i o's

443-9700

ITALIAN-AMERICAN
CUISINE

Featuring This Week...

**Pork Braciolettine
Alla Korrin**
\$ 13.95

401 Main St.
Newport

Closed Mondays

Claris' black-and-white MacPaint offers a solid array of tool options and type styles, plus the ability to save frequently used text and art as template files.

the program offers most of the capabilities you're likely to need.

Combine a crisp interface, pull-down (or pop-up) tool and pattern palettes, a host of tried-and-true paint features, and well-designed documentation (80 clearly written pages), and you've got a combination that's hard to beat.

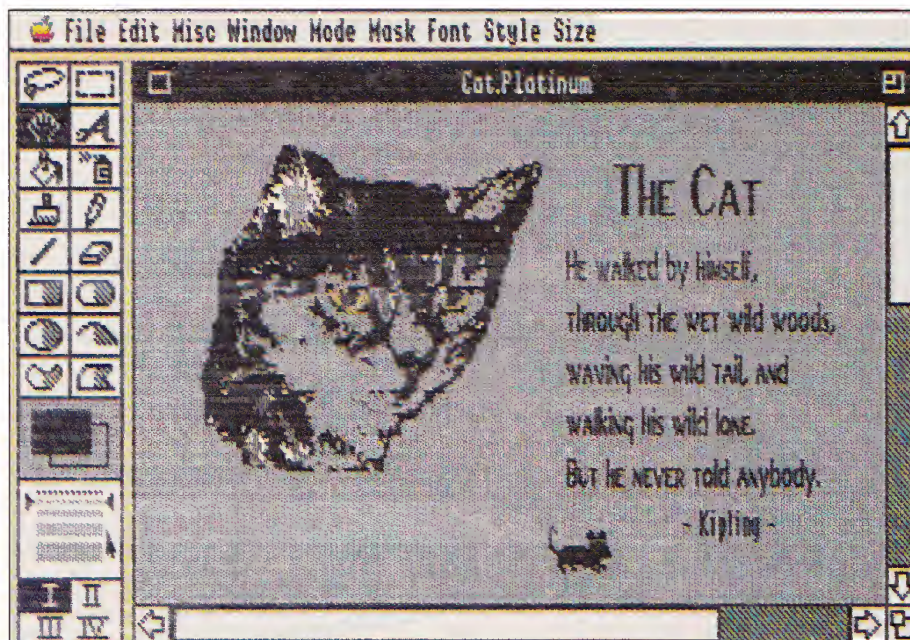
PLATINUM PAINT 1.01

If the Apple of your eye is a IIGs, run, don't walk, to your favorite software vendor and get your hands on a copy of Platinum Paint, a Beagle Bros product we admire absolutely unabashedly (Editors' Choice, January 1991, p. 112, reviewed in April 1991, p. 32). Truth be told, if we were forced to prepare a head-to-head feature comparison between this GS program and the Macintosh products we've described in this article, Platinum Paint could beat the competition to a juicy red pulp.

Like its Mac counterparts, Platinum Paint supports multiple document windows and offers a selection of standard painting tools, such as the marquee, the lasso, the airbrush, and the polygon. You can even use analogous Mac keyboard commands to open and save files or to constrain shapes or tool actions. The program's paint bucket performs gorgeous gradient fills, and its dropper lets you switch paint color as fast as you can say "Macintosh."

But Platinum Paint offers a whole lot more. For one thing, the program sports the longest list of editing features we've seen. Not only can you flip a selection both horizontally and vertically, you can mirror it, halve it, double it, stretch it, slant it, freely rotate it, add perspective to it, and cast a shadow beneath it. Don't worry about getting carried away with all these changes: You can mask colors or selected areas so that you don't alter them.

As you might expect, learning Platinum Paint's countless nuances presumes spending some time with the program's documentation, a 124-page manual that's nicely illustrated and written with both clarity and style. The abundance of sample files that accompany the program can help you become familiar with some of Platinum Paint's outstanding capabilities. We particularly enjoyed the program's



Screen dump from Beagle Bros' Platinum Paint for the GS. The program is compatible with a sizable range of Apple II graphics formats, and offers a unique selection of image-editing capabilities and brush effects.

short tutorial lessons on squishing custom brushes, colorizing gray-scale images, and animating artwork through color cycling.

Best of all, this one gives you room to grow: The ability to import a wide variety of Apple II graphics (including Print Shop and Print Shop GS formats) and a choice of normal, matte, smear, slide, charcoal,

shade, wash, and smooth brush methods mean you won't have to worry about outgrowing Platinum Paint anytime soon. □

CYNTHIA FIELD IS THE AUTHOR OF PRESS ROOM, OUR COLUMN ON DESKTOP PUBLISHING. WRITE TO HER AT 60 BORDER DRIVE, WAKEFIELD, RI 02879. ENCLOSE AN SASE IF YOU'D LIKE A PERSONAL REPLY.

PRODUCT INFORMATION

Amazing Paint 1.01

CE Software
P.O. Box 65580
West Des Moines,
IA 50265
(515) 224-1995
\$99.95
512K Macintosh

Color MacCheese 2.0.5

Baseline Publishing
1770 Moriah Woods Blvd.
Suite 14
Memphis, TN 38117
(901) 682-9676
\$99.95
1MB Macintosh,
System 6.0.4 or later,
color QuickDraw in ROM

Color 'n' Canvas

Wings for Learning
1600 Green Hills Road
Scotts Valley, CA 95067
(408) 438-5502
\$99
1MB Apple IIGs

Easy Color Paint 2.0

Creative Software
3213 Annandale Road

Durham, NC 27705

(919) 493-9503
\$89
1MB Macintosh,
System 6.0.2 or later

Kid Pix 1.0

Broderbund Software
17 Paul Drive
San Rafael, CA
94903-2101
(415) 492-3200
\$49.95 home edition
\$59.95 school edition
\$119.95 lab pack
1MB Macintosh,
2MB for color monitor,
hard disk or two 800K,
System 6.0 or later,
System 6.07
and Farallon MacRecorder
for sound recording

MacPaint 2.0

Claris Corp.
5201 Patrick Henry Drive
Box 58168
Santa Clara, CA
95052-8168
(408) 987-7000
\$125

512K Macintosh,
hard drive or two 800K,
System 6.0.2 or later

MacRecorder

Farallon Computing
2000 Powell St.
Suite 600
Emeryville, CA 94608
(415) 596-9000
\$249
Mac Plus or later

My Paint

Saddleback Graphics
12812 Garden Grove Blvd.
Unit P
Garden Grove, CA 92643
(714) 741-7093
\$49.95
512K Apple IIGs

Platinum Paint 1.01

Beagle Bros
6215 Ferris Square
Suite 100
San Diego, CA 92121
(619) 452-5500
\$99.95
1MB Apple IIGs

LITTLE BROWN JUG POLKA

TRADITION

Allegro moderato



COMMAND PERFORMANCE

For teaching, recital, and composition, in classrooms, concert halls, and studios, Apple IIs and Macs deliver a powerful sound.

By GREGG KEIZER * CONTRIBUTING EDITOR

If the closest you come to making music is whining along with Neil Young on your car radio or dancing in your briefs to an MTV riff, you're not alone. Millions of us can't carry a tune to save our lives.

Fortunately, millions can — millions of machines, that is. Apple computers — from the sedate IIe to the boisterous IIGs to the professional Macintosh — can sing like a Baptist choir, swing from country to rock as quick as the Kentucky Headhunters, and soar in symphonic power like the Boston Pops. If you want to make music but can't read a note, an Apple II or a Mac will let you jam along. If you teach music, the computer is an infinitely patient one-on-one instructor. And if you're a professional musician — a performer or composer — a computer/synthesizer combination puts a whole orchestra and sound studio on your desktop.

Still think computers and the fine arts don't mix? Think again — and listen to what music lovers are doing with IIes, GSeS, and Macs as their instruments. The pros — musicians and teachers — have blazed this new technological path, but even those of us who thought we could only warble along get to reap the notes they've sown.

SILICON VALLEY SINGS

Long before the term *MIDI* (*musical-instrument digital interface* — see our accompanying story, "The MIDI

Beat," on p. 44 in this issue for details) meant anything to the rest of us, San José Academy was connecting Apple IIe computers with Casio keyboards in an innovative teaching laboratory.

A magnet school that attracts 16 different minority groups to its fine-arts and technology-based curriculum, San José Academy sports one of the most impressive electronic-music programs in the country. Dr. Hal Peterson, head of the fine-arts department, runs the MIDI lab as well.

"I'm teaching music through technology," says Peterson, as he looks out over the lab's 24 Apple IIes, banked in two rows and spread out on both sides of his command center. "We do most of our instruction through computers rather than through traditional means."

That's easy to see when you take a walk through Peterson's lab. Each student workstation features an Apple IIe, a Casio CZ-1 synthesizer, a Passport MIDI interface, and a color monitor. Connected via a Corvus Omninet network to a 126-megabyte file server, the workstations are also linked to five ImageWriter II printers.

At the front of the room, Peterson's teaching center includes a similarly equipped IIe, as well as a spaceship-style panel that controls the lab. A compact-disc

MUSIC-EDUCATION PRODUCTS

Bank St. Music Writer

Software Toolworks
60 Leveroni Court
Novato, CA 94949
(415) 883-3000
\$49.95 Apple II

Composer Notation, \$495 Mac
Performer, \$495 Mac
Mark of the Unicorn
222 Third St.
Cambridge, MA 02142
(617) 576-2760

ConcertWare+, \$69.95 Mac
ConcertWare+MIDI,
\$189.95 Mac
KidsTime II, \$34.95 GS
Great Wave Software
5353 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-1990

Music Construction Set,
\$14.95 Apple II
**Deluxe Music
Construction Set**,
\$129.95 Mac
Instant Music,
mail-order sources/GS
Instant Synthesizer,
\$19.95 GS
Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171

Diversi-Tune
Diversified Software
9312 Harvey Road
Silver Spring, MD 20910
(301) 942-2261
\$75 GS

Harmony Grid
Hip Software
117 Harvard St.
Cambridge, MA 02139
(617) 661-2447
\$99 Mac

Instrument Designer,

\$129 GS
Music Writer GS, \$119 Ltd.,
\$295 Special, \$595 Pro
Music Writer,
\$295 Special/Apple II,
\$595 Pro/Apple II
Pygraphics
P.O. Box 639
Grapevine, TX 76051
(817) 481-7536

Jam Session
Broderbund Software
17 Paul Drive
San Rafael, CA 94903-2101
(415) 492-3200
\$49.95 GS, \$49.95 Mac

Listen
CTM Development
1013 South Claremont
San Mateo, CA 94402
(415) 573-8945
\$99 Mac

Master Edition Series,
\$30 - \$150 Apple II
Music Printer 2.0,
\$149 Apple II
Temporal Acuity Products
300 120th Ave. NE
Bellevue, WA 98005
(206) 462-1007

Micro Notes
Teachnology
11220 West Florissant
St. Louis, MO 63033
(618) 466-1775
\$495 Apple II or GS

Music Class Series,
\$39 - \$49 Apple II
Perceive, \$99 Mac
Coda Music Software
1401 East 79th St.
Minneapolis, MN 55425
(612) 854-9554

Music Mouse

Dr. T's Music Software
100 Crescent Road
Needham, MA 02194
(617) 455-1454
\$79 Mac

Music Shapes 1.6
Music Systems for Learning
76 Davenport Road
Roxbury, CT 06783
(203) 355-3454
\$79.95 home/Apple II or GS
\$129.95 school/Apple II or GS
(Simon & Schuster)

Music Studio 2.0

Activision
3885 Bohannon Drive
Menlo Park, CA 94025
(415) 329-0800
mail-order sources/GS

Music Theory

MECC
3490 Lexington Ave. North
St. Paul, MN 55126
(612) 481-3500
\$49 Apple II

Notable Phantom

Britannica Software
345 Fourth St.
San Francisco, CA 94107
(415) 597-5555
\$9.95 Apple II

Practica Musica 2.2

ARS Nova
Box 637
Kirkland, WA 98083
(800) 445-4866
\$125 Mac

Stickybear Music

Weekly Reader Software
10 Station Place
Norfolk, CT 06058
(203) 542-5553
\$49.95 Apple II
\$85 lab pack

player, a laser-disc player, and a video-cassette recorder let him pump music over speakers or display video on every monitor.

Because much of Peterson's program originates as software-based instruction, the network is vital, letting students progress at their own speed as they learn basic keyboard technique, musical notation, electronic sound creation and editing, sound sampling, and more. Peterson lobbied software publishers to make their packages work on the network; the result is a collection of site licenses for more than 40 programs.

A lab session may see Peterson at his command center, playing a sequence on his Roland synthesizer over his students' earphones. He may put on a laser disc highlighting several composers of classical music. Kids may walk themselves through a self-paced lesson on digital sampling, or work on their own musical projects.

The technology doesn't work without some sweat, though. Setting up the network was a minor nightmare; keeping it up and running is almost a full-time job. And though the Apple IIe was the right choice when the lab was built, Peterson looks forward to the day when he can integrate more powerful machines into the lab. "I need high-end workstations for the advanced students," he explains. "The Macintosh is the machine of the music industry. And there are certain things that the PC can do," particularly with the more sophisticated music-editing and notation software commercially available in the MS-DOS marketplace.

But Peterson says he won't give up his Apple IIe stations. "The kids don't want to just read things — they want you to show them," he observes. Peterson does just that, playing student projects over huge speakers or putting scrolling scores on the students' monitors. "It's a powerful way to present ideas, and music," he notes.

"The computer is like a textbook," says Garrick Wahlstrand, one of Peterson's charges, "but you don't have to carry a textbook around." Adds Kiki Walker, another student, "The computer lets you work at your own speed. You can arrange a piece of music one instrument at a time, in small pieces."

The technology isn't cheap — the computer parts of the lab carry a price tag of

well over \$100,000 — but Peterson sees a more pressing limitation: "The reason you don't see more classes like this is a matter of training. The kids aren't threatened by this, but many music teachers are."

MUSIC ON THE MOUNTAIN

High atop a ridge overlooking Hartford, Connecticut, on the former site of an anti-aircraft missile battery, kids play Apple IIcs computers like so many musical instruments.

The Talcott Mountain Science Center gives children a glimpse of the future. With 22 telescopes, a Doppler weather radar system, a national satellite network, and a range of other high-tech hardware items, the school spreads hands-on learning among children in the Hartford area, throughout New England, and across the country. Donald La Salle, Talcott's director,

calls it an attempt to "give kids technology and literally turn them loose."

Children come from neighboring towns for day-long and weekend instruction, while 60 exceptionally gifted students attend the center's on-site day school. All get a crack at Talcott's many computers, including its Apple IIcses, which specialize in making music. Sixteen of them stock one of the center's two labs. With the exception of inexpensive headphones, the computers are off-the-rack, 1-megabyte machines.

"Music for the younger kids is strictly based on the Apple IIcs," says Greg La Salle, the center's music teacher. "All their training stems from learning to write music." And that's possible because of the machine's accessible, built-in graphics and sound capabilities.

"You don't have to add anything to the GS," La Salle explains. "For teaching, it's

more than adequate. Music used to mean learning theory first, and not being able to do anything with it. Now it's just the opposite. Kids get turned off because they can't play an instrument well, or at least for years. Now, with the GS, they can write their own music. And strangely enough, because they're writing it, it doesn't matter what it sounds like."

La Salle uses **Music Shapes**, from Music Systems for Learning, with the younger children — it's ideal for ear training, basic composition, and building instruments with the GS' 15-voice Ensoniq sound chip. From there, Activision's **Music Studio** takes over, and students begin to put notes on screen. Other GS software packages La Salle engages include **Instrument Designer** from Pygraphics' Pyware line — a great program for learning sound sampling — and **Music Writer** (also from Pygraphics), the best music-printing software available for the machine, according to La Salle. He boots up Electronic Arts' **Instant Music** to entice uninterested students into simply "mousing around."

"Eventually, they hook up MIDI keyboards," says La Salle. "Usually they'll MIDI up what they've done in Music Studio because they don't have to redo any of their work. In fact, all their work is saved from the fourth grade until the time they graduate." In effect, the Talcott Mountain plan means that students' music can grow as they grow as musicians.

The GS brings a slew of benefits to any music program, claims La Salle. Composition and performance are easy with the GS, he explains, so "kids retain a lot more, because they're using what they're learning. It quickly gets them to a level where they can use the things they've learned, and it gives them a chance to explore a variety of musical styles." Without a computer like the GS, adds La Salle, "you couldn't do orchestral arrangements with elementary-school kids; you couldn't print music."

"And they get to bring recordings of their work home," La Salle notes. "Kids bring home art to put up on the refrigerator, but what do they bring home from music class? How many parents sit and listen to their kids play the violin? With the computer, kids can create music, tape it, and bring home cassettes.

"It's a zillion times easier since we added

the GS," concludes La Salle. "Kids learn — and learn more thoroughly — with the IIGs computers."

A JAZZ BEAT IN THE BIG EASY

New Orleans — home to Bourbon Street, Mardi Gras, and jazz — plays like no other city. So it comes as no surprise that the Orleans Parish School District features a school for the performing arts.

The New Orleans Center for Creative Arts (NOCCA) is a half-day high school specializing in music, theater, dance, writing, and the visual arts. Students attend their home high school for the academics, then hit NOCCA for intense instruction in their areas of interest. In music, NOCCA students focus on jazz instrumental, classical instrumental, or classical vocal study.

Stephen Dankner, the next chairman of NOCCA's music department, is a big believer in computers. A professional musician with some impressive credentials of his own, Dankner has overseen the school's "Computing in the Arts" program and was instrumental in bringing technology to NOCCA's music program.

The three dozen music students at NOCCA share a workstation that includes a Mac SE, three sophisticated synthesizers with a total capacity of 60-some voices, an effects processor, and sequencing and notation software. Though Dankner stresses traditional methods of composition — even as far as requiring students to score a piece in longhand first — he holds the Mac in high regard. "I couldn't conceive of anything else," he admits, adding that "students take to the Mac like a duck to water. It's an amazing machine. They don't need any outside help at all, and in fact can do high-caliber work in a very short time."

As a tool for composition and notation, the Mac SE, running Mark of the Unicorn's **Performer** and **Composer Notation** programs, is, in Dankner's words, "a new way to hold a pen. It's a visually based system of composition and performance that allows instant access to ideas, and lets you modify them for much quicker response time. The old days of trying things out and paying performers to let you hear what your work sounds like were much slower. [The computer] lets you try things out to make sure they're going to work."

The Mac puts a musical word processor

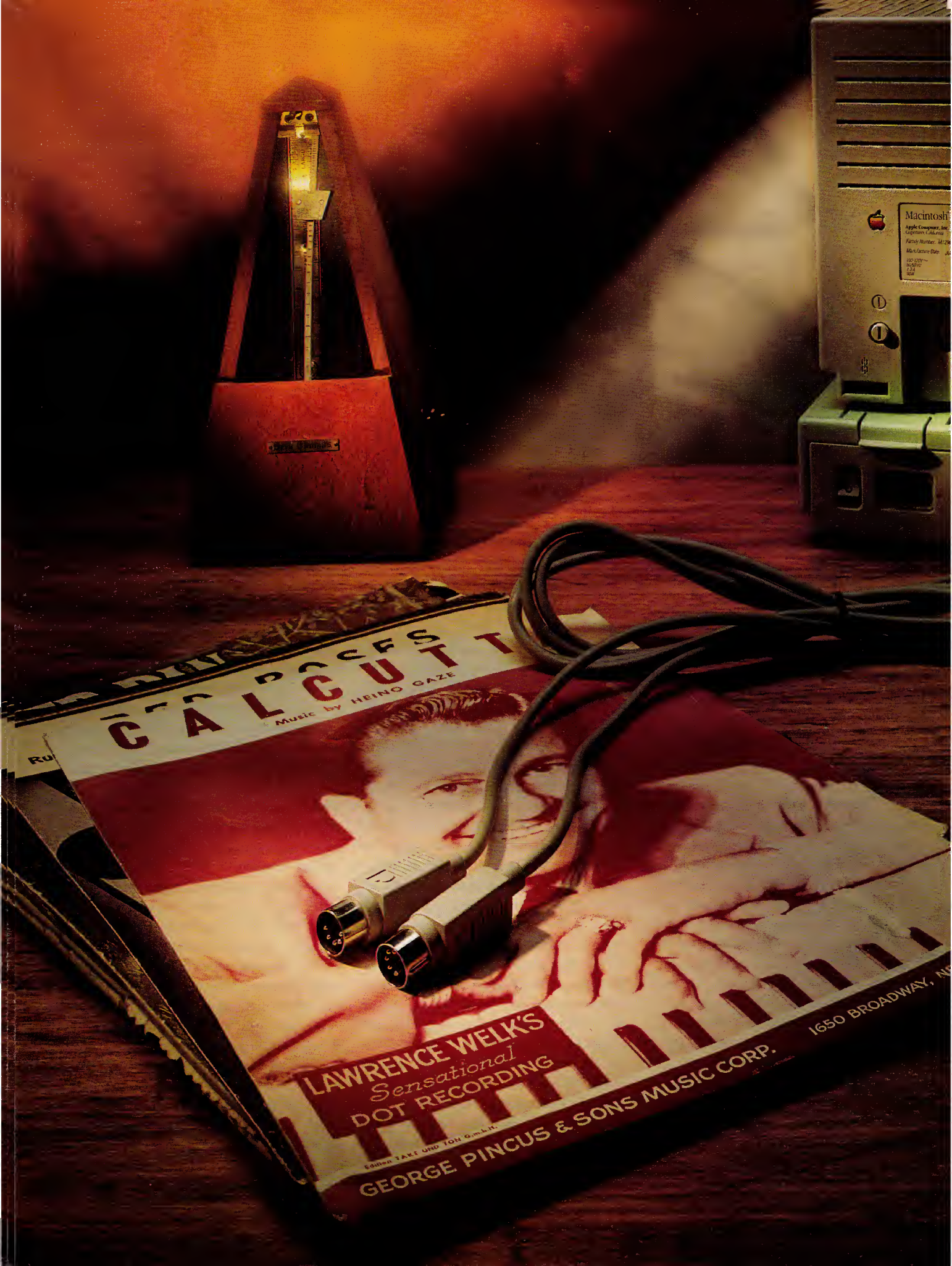
in the hands of his students, Dankner explains: "If you don't like something, you can cut and paste until it's perfect. It's revolutionary. If Bach had had this, he wouldn't have had to guess what he'd written. It makes my work more concise. I can always try it out to make sure it's exactly what I want."

In his home studio, Dankner runs a Macintosh II, three hard-disk drives, three Kurzweil synthesizers, a mixer, and a full MIDI keyboard to compose and refine his own music. The setup provides an instant orchestra, letting him re-create music such as his recent piano and cello concertos without leaving home. "I can do a full orchestration on tape," he says. "I can give that tape to anybody, and they don't have to imagine what my music sounds like. They can hear it for themselves."

At the New Orleans Aquarium of the Americas, a new attraction alongside the Mississippi River, a Mac Plus connected to eight synthesizers plays four hours of Dankner's music as background in the Caribbean, Mississippi, and Gulf of Mexico exhibits. The seven-month project resulted in a score more than 500 pages long and music files of more than a megabyte. But Dankner says he doesn't feel that his home studio helped him write music faster, or be a more productive composer — it simply made him more creative. "The more you work with computers [in music] the more you realize they can't replace human beings," he says. "The soul and artistry of a good player just can't be replicated."

Even in music instruction, computers are no panacea to Dankner — but in their place as one in an array of tools for teaching, composition, and performance, they fill a niche that can support a curriculum in new ways. Balance is the key to getting the most from the machine. "I see the whole application as a veneer over the traditional way to teach music," Dankner states. "I believe strongly in that. You have to be able to hear and read music in the traditional ways. Integrating this layer just makes you a more powerful composer." □

CONTRIBUTING EDITOR GREGG KEIZER IS THE AUTHOR OF BRIDGING THE GAP, *inCider/A*'s MONTHLY COLUMN ON APPLE II/MAC CONNECTIVITY. WRITE TO HIM AT 614 LINDEN STREET, SHREVEPORT, LA 71104. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY.



The MIDI BEAT

What have M.C. Hammer, David Gilmour, and Steve Vai got that you haven't got? Talent? Well, sure, but you can't do anything about that. Money? Yeah, but they had to start at the bottom, just like you. What about their musical equipment? Chances are they're using *synthesizers* — electronic instruments that work together through *MIDI*, an acronym that stands for *musical-instrument digital interface*, the *lingua franca* of sound-generating chips.

MIDI was born in the early 1980s as a way for musicians to exchange information between synthesizers that weren't manufactured by the same company. At first it was of interest only to professional musicians, but as developers began to see that you could cable a personal computer to a synthesizer and control the instrument through the computer's software, MIDI rapidly turned into a marketplace buzzword.

Today, the MIDI standard is to the electronic-music business what SCSI (*small-computer-systems interface*) is to the home-computer industry. Whether you're a performing musician, a composer, or someone who just likes to tweak notes in your basement, you can plug into your Apple II or Macintosh with MIDI.

TUNE IN

Even if MIDI didn't exist, you could still walk over to your electronic keyboard and play one of Bach's cantatas or *Chopsticks*, whichever's your speed, because

How does one person
play *A Bicycle Built*
for Two in three-quarter
time on four instruments?

Through the magic of MIDI,
of course. All together now . . .

By CAMERON CROTTY *

ASSOCIATE EDITOR

all synthesizers have their own internal sound generators. With MIDI, you don't teach your synthesizer new sounds — you tell it when and how to play them. MIDI's purpose is to allow the transmission of performance data, such as when a note starts, its pitch, and when it ends.

Why use MIDI? Professional performers often hook up two or more synthesizers playing in sync to create a fatter sound with subtler harmonics. But when was the last time you played the Meadowlands to a sold-out crowd? MIDI gives amateur musicians new options, too. MIDI data is *digital*, which is where personal computers come in — you can connect your MIDI instrument via cable to an interface device and from there to your Apple, and, with the right software, record your performance on disk as you play your synthesizer.

You might tell your program to convert your music to a full conductor's score (or wave forms or other geometric symbols, in some cases) on screen; the software's

GLOSSARY

Aftertouch. Pressure applied to a key after a note has been struck.

Click track. Audible clicks produced by your sequencer to keep you on the beat as you play.

Foot switch. Foot-operated switch, often used to control sustain.

MIDI. Musical-instrument digital interface. Established standard for transmitting data between electronic musical instruments, computers, and other devices.

Patch. Specific instrument sound from a synthesizer, used to play notes. Also called **voice**, and, more broadly, **timbre**. A maximum number of voices is programmed into synthesizer.

Polyphonic synthesizer. Capable of playing more than one note at a time.

Polytimbral synthesizer. Capable of playing more than one patch at a time.

Punch in. MIDI or tape-recorder feature allowing user to switch from playback to record at a preset location in a musical sequence.

Quantization. Computer-controlled correction for sloppy rhythmic play.

Rack mount. Components designed to fit into an audio rack.

Sampler. Plug-in sound-digitization card for computers, or stand-alone unit that records short sequences of (analog) voices, sounds, and music; converts them to digital data and stores them on disk for inclusion in synthesized music composition as desired. Accompanying software allows editing of sound data for speed, volume, fade, reverse, stutter, and so on.

Sequencer. Computer program that records on disk digital data representing music characteristics (not the music itself, as a tape recorder would) from synthesizer; allows music editing, such as deletion, transposition, adjustments to tempo and volume, and so on, and playback through synthesizer. Maximum number of tracks user can record and mix varies from program to program. Interface (controlled by mouse, arrow keys, keyboard overlay, or some combination) shows on-screen notes and staves, wave forms, colored boxes and lines, or other representation of music.

Synthesizer. Music-generating computer chip (such as GS' Ensoniq), plug-in card, or stand-alone electronic instrument (keyboard, wind, percussion, guitar most popular). MIDI instrument outputs music two ways: through its own speaker as analog sound heard by listener, and as digital data representing each note's characteristics (timbre, pitch, volume, and so on) according to MIDI standard.

Step input/editing. Notes recorded separately, edited one at a time, and strung together to produce musical sequence; as opposed to real-time input.

Timbre. Sound characteristics of a particular type of instrument (piano, flute, violin, and so on).

Track. Musical sequence recorded one (or a few) instruments (**voices**) at a time (not simultaneously); individual tracks combined to produce multi-instrument sound. Allows punching in for re-recording of one segment of music by one voice; allows editor to hear individual voices for clean editing and adjustment; allows one player to perform on all instruments by recording one instrument at a time, then mixing.

Transcription software. Program that lets user write musical notation on screen from computer keyboard; may also record notation on screen automatically as user plays synthesizer.

editing function will then let you cut and paste as you choose — something like word processing for music. (Many programs let you make a hardcopy, too, if your printer's hooked up.)

You can then tell your computer to send the new version back to your synthesizer, or to several MIDI devices at once if you like, and play it for you from the score you've just written. And because MIDI is an agreed-upon standard among computer manufacturers, you can also

transport your recording on disk between machines that use different operating systems, if the program you're using with the second computer contains a translator module.

We'll get into your software options later. First, let's turn on the bright lights and poke around in MIDI's innards.

KNOCKING ON HEAVEN'S DOOR

The central component of any MIDI system is, of course, the synthesizer. If you

haven't purchased one yet, now is the time to consider the role you want it to play. Are you an accomplished pianist? Then you might want to consider a full keyboard with weighted keys and lots of pressure/velocity sensors to take advantage of your skill. Foot switches and pedals let you manipulate volume and sustain on the fly.

For the pianist with the soul of a clarinet player, some synthesizers offer input through a breath controller, which lets you play notes on your keyboard while you blow into a small device that translates airflow into attack, sustain, and volume.

If you play a wind instrument for real, you might want to consider an input device that looks and plays much like, say, a saxophone. Guitar controllers are also common among MIDI musicians.

The abilities and limitations of your synthesizer's microprocessor — the selection of *timbres* (different instrument sounds, or *voices*) programmed into it and the complexity of the music they produce — should be another important factor in your decision. Most synthesizers currently on the market are *polyphonic* — they can sound more than one note at a time. Some are limited to four notes at once, while others can play eight or 16.

But although most synthesizers can mimic a number of different instruments, only a few can play more than one of their instrument sounds at the same time, such as flute and trombone together. Those that can are called *polytimbral* and are usually more expensive, but they'll save you the cost and trouble of setting up several synthesizers when you want to play multi-instrument scores.

THE EXTRAS

Once you've got your main synthesizer, you can start thinking about other components. How about a *drum machine* — a box that produces synthesized percussion? It's expensive, but for a performance-oriented musician, it's worth it.

Drum machines are button operated — they don't play easily like an instrument — but if your unit comes with special software, you can cut and paste rhythms together for a final sequence the device can play as you perform on your synthesizer.

Dr. T's Music Software markets an alternative drum-machine software controller

SESSION IN PROGRESS

Apple computers have earned a home in the studios of professional musicians — Joey Latimer and his Mac-based music system prove it. Latimer, a former recording engineer with a Southern California studio, now operates his own recording studio out of his house in Idyllwild — and a Macintosh SE helps him run his operation. In the studio's control room, the SE connects with Latimer's MIDI equipment, which includes a Kawai K-1 multitimbral synthesizer, a Roland MT-32 sound module, a Casio CZ-101 keyboard, and a Roland drum machine. Two mixing boards and a rackful of effects gear complete the hardware.

"You can simulate a whole band at your fingertips," says Latimer of his SE/MIDI setup. "If we write a new song and want to try it out to see what it sounds like with the band, we can do it. In fact, we can assemble all kinds of orchestration without much work at all."

Using **Vision**, a sequencer for the Macintosh from Opcode, Latimer can call up sampled sounds and electronic instruments to add texture to the tunes he cuts for others, and for himself. "I recorded my entire last album, *The Coyote and the Princess*, with the computer, so I could remaster it digitally," Latimer explains. "Everything we do is played into either the computer or the tape machine. That lets us try things out quickly, and makes all the sounds transportable." In other words, the Mac makes it possible to assemble and reassemble music in an infinite variety of ways for just the right sound. That ability will come in handy when Latimer takes his record company, Idyllwild Music, into the world of compact discs. Idyllwild plans to put out its first CD, a sampler of Latimer's five initial albums of contemporary folk music, this fall.

Latimer likes the Macintosh for several surprising reasons. For one thing, he says, "it has a small footprint [the space it occupies on the desktop]. And the Mac is very quiet and subdued compared to a PC," which often features fans that sound like rockets in the quiet of a studio.

Cutting records on a shoestring means cutting costs, too. The Mac helps by making it possible for an individual musician like Joey Latimer to create music without the expense of studio musicians or a live band. "I'm on my fourth Mac," he says. "I just like its style."

— Gregg Keizer

called **UpBeat** for 512K Macintoshes.

With MIDI, you can start small and add to your system piece by piece. *Rack-mount synthesizers*, for instance, so named because they mount in a rack like stereo components, give you the brain and sounds of a synthesizer without making you pay for another keyboard.

Components called *samplers* accept sound from an acoustic instrument or the human voice and translate it into MIDI data; with software such as Passport's **Alchemy** and Digidesign's **Sound Designer** for the Mac (part of Digidesign's high-end **Sound Tools** hardware/software package), you can edit the data and incorporate it into your synthesized compositions.

Alternatively, you can plug a *digitizer* card into your computer for the same purpose. For the GS, there's Applied Engineering's **Sonic Blaster**; for the Mac there's Farallon's **MacRecorder**. Accompanying software lets you edit the sound — cut and paste, and adjust volume, speed, fade, and so on.

The Mac LC includes built-in sound digitization and comes with a microphone; you can access this feature with a program called **Voice Navigator** from Articulate Systems.

MIDI TALK

So what kind of data does your MIDI system generate? MIDI data describes a series of events that occur over time. The most important directly control the sounds coming out of your speaker by way of the synthesizer's voice. They're called *channel voice messages* and there are seven of them: note on, note off, polyphonic key pressure, channel pressure, program change, control change, and pitch-bend change.

Note on and *note off* are exactly what they sound like — they signal the beginning or end of a note. A note-on message usually contains the pitch of a note; some synthesizers can also sense its *attack velocity* — the speed at which you depress a key, usually interpreted as loudness, or volume.

Polyphonic key pressure and *channel pressure* measure how hard you press a key after a note has been played; your synthesizer will adjust vibrato or volume depending on the pressure. These messages are usually grouped together as *aftertouch*, or the way

the note changes after you play it. A mechanism such as a volume pedal or a sustain foot switch send *control-change* messages. Most synthesizers have a built-in *pitch-bend* wheel for manual adjustment; it signals the synthesizer to bend the pitches it's playing either up or down.

Program change signals a synthesizer to switch voices — from flute sounds to piano, for instance. (Synthesizer voices are also called *patches*, because musicians once had to physically move wires called *patch cables* to get different sounds.)

Other types of MIDI data include *system real-time* and *system common* messages, received by all devices on the MIDI network to help coordinate timing and tuning.

All this data is transmitted through cables that carry 16 discrete channels apiece to and from your computer and your music system's components.

A MIDI device can "broadcast" and "receive" incoming data on any or all channels, according to the assignments you make at each MIDI device. In a large, complex system, all 16 channels can be busy at once,

carrying different messages to up to 16 different instruments.

THE INTERFACE ROUTE

Cables are hooked into one of three kinds of ports: MIDI IN, MIDI OUT, and MIDI THRU. IN and OUT function as their names imply, bringing input and output to and from the synthesizer's microprocessor. The THRU port avoids the processor and sends out an exact copy of what was received at the IN port, allowing all devices in a network to have equal access to all 16 channels.

How does MIDI data get from your synthesizer and its accessories into your computer? You'll find several avenues open to you on this part of the MIDI journey. One of the simplest is Apple's own external **MIDI Interface** box (for either the GS and the Mac), which turns MIDI IN and OUT into Apple-standard serial input via cable through your computer's printer or modem jack.

Applied Engineering makes an external MIDI interface called **Audio Animator** for the GS; Roland makes a combination

interface for the IIe — the **MPU-401** external box with internal **MIF-APL** card. Passport Designs makes an external **MIDI Interface** for the Mac and the GS.

THE FLIP SIDE

Anyone who has ever tried to edit **MIDI** data on a dedicated sequencer — something like word processing with a ten-key layout and a 12-character LCD — will appreciate the greater processing power and flexibility a computer can provide. Of course, simply hooking a computer up to your synthesizer doesn't automatically give you any more control over your music — that's where software comes in.

In the early days of recorded music, producers learned that if they recorded each musician on a separate track through individual microphones, they could get a cleaner sound and control the volume of each instrument when they mixed the

tracks back together. Also, if an artist blew a lick, they could just go back and rerecord that instrument, instead of making the whole band play the song over again.

Today, the technology has improved to the point that a musician can *punch in* — rerecord a specific section of a specific track. The process is called *track sequencing*, and in a modern studio it's possible for one person to play every instrument on an entire record, from drums to vocals to lead guitar. In fact, several pop stars have taken this approach.

Performers use sequencing to get their albums just right. Composers can use sequencing to hear what their full works will sound like, even though they can play only one instrument's score at a time. Similarly, using **MIDI-compatible** sequencing software in your home studio can let you create complex musical pieces even if you're not an instrumental virtuoso.

Sequencing programs offer a number of features, such as easily adjustable tempo controls, the ability to transpose pieces to different keys, and the option to cut, copy, and paste measures just as you would text with a word processor.

Most programs can also handle both step and real-time input with adjustable quantization values. For *real-time input*, you have the computer give you an audible tempo called a *click track* (sort of an electronic metronome) and play the music as you would normally. With *step input*, you can enter notes one at a time, then adjust their duration (and pitch, if necessary) manually and put them together via the software.

Quantization can make up for human timing errors by shortening or lengthening notes slightly to correct for rhythmically sloppy play. Quantization can be a great relief if your sense of timing isn't up

PRODUCT INFORMATION

Alchemy,
\$695
Mac
Encore,
\$595
Mac
MIDI Hits,
\$29.95
Mac
MIDI Interface,
\$129.95
GS or Mac
Pro4,
\$495
Mac
Trax,
\$99
Mac
Passport Designs
625 Miramontes St.
Half Moon Bay,
CA 94019
(415) 726-0280
(800) 443-3210

Audio Animator,
\$219
GS
Sonic Blaster,
\$129
GS
Applied Engineering
P.O. Box 5100
Carrollton,
TX 75011
(214) 241-6060

Casio, Inc.
15 Gardener Road
Fairfield,
NJ 07006

ConcertWare+MIDI
Great Wave
Software
5353 Scotts
Valley Drive
Scotts Valley,
CA 95066
(408) 438-1980
\$189.95
Mac

**Deluxe Music
Construction Set**
Electronic Arts
1820 Gateway Drive
San Mateo,
CA 94404
(415) 571-7171
\$129.95
Mac

Diversi-Tune
Diversified
Software Research
9312 Harvey Road
Silver Spring,
MD 20910
(301) 942-2261
\$75
GS

Finale
Coda Music
Software
1401 East 79th St.
Minneapolis, MN
55425-1126
(612) 854-1288
\$749
Mac

Jam Factory,
\$179
Mac
M,
\$179
Mac
Upbeat,
\$199
Mac
Dr. T's
Music Software
100 Crescent Road
Needham,
MA 02194
(617) 455-1454

**Kawai America
Corporation**
2055 East
University Drive
Compton,
CA 90224
(213) 534-2350

**Kurzweil
Music Systems**
411 Waverley
Oaks Road
Waltham,
MA 02154
(617) 893-5900

MacRecorder
Farallon Computing
2000 Powell St.
Suite 600
Emeryville,
CA 94608
(415) 596-9100
\$249
Mac

MIDIBASIC
Altech Systems
122 Faries
Industrial Park Drive
Shreveport,
LA 71106
(318) 226-1702
\$99.95
Mac

MIDI Interface
Apple Computer Inc.
20525 Mariani Ave.
Cupertino,
CA 95014
(408) 996-1010
(800) 776-2333
\$99
GS or Mac

MPU-401,
\$199.50
Apple IIe
MIF-APL,
\$130
Apple IIe
Roland Corp US
7200 Dominion
Circle
Los Angeles,
CA 90040
(213) 685-5141

Music Studio 2.0
Activision
3885 Bohannon Drive
Menlo Park,
CA 94025
(415) 329-0800
available from
mail-order sources
GS

Music Writer GS,
\$119
Limited,
\$295
Special,
\$595
Professional
Music Writer,
\$295
Special,
\$595
Professional
Apple II
Pygraphics
P.O. Box 639
Grapevine,
TX 76051
(817) 481-7536
(800) 222-7536

Performer,
\$495
Mac
**Professional
Composer,**
\$495
Mac
Mark of the Unicorn
222 Third St.
Cambridge,
MA 02142
(617) 576-2760

**Sound Tools with
Sound Designer**
Digidesign
1360 Willow Road
Suite 101
Menlo Park,
CA 94025
(415) 688-0600
\$3285
Mac

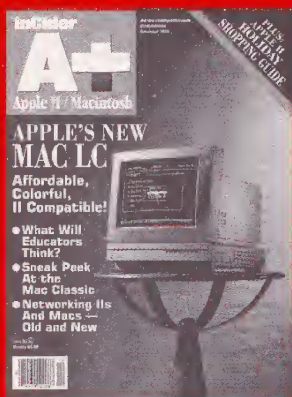
SynthLAB
Apple Programmers
and Developers
Association
(APDA)
Apple Computer Inc.
20525 Mariani Ave.
MS-33G
Cupertino, CA
95014-6299
(800) 282-2732
\$25
APDA members only
GS

Vision
Opcode Systems
3641 Haven Drive
Suite A
Menlo Park,
CA 94025
(415) 369-8131
\$495
Mac

Voice Navigator II
Articulate Systems
99 Erie St.
Cambridge,
MA 02139
(617) 876-5236
\$795
Mac

**Yamaha Corp.
of America**
P.O. Box 6600
Buena Park,
CA 90622
(714) 522-9011

SAVE 54%



DON'T MISS:

Reviews of educational products
for home and school.

Time-saving hints and techniques.

In-depth articles that help you
stretch your Apple to the max.

Solutions for your personal
finance & home office needs.

Easy and affordable
desktop-publishing projects.

DON'T WAIT.

Order your subscription today!

SAVE 54%!

inCider

A+

Apple II/Macintosh

Please make checks payable to *inCider/A+*.
Basic two-year U.S. subscription price is \$43.00.
All foreign orders must be prepaid in U.S. funds
drawn on a U.S. bank. One year rates: Canada
\$37.97 (price includes GST), Mexico \$37.97,
Foreign Surface \$47.97, Foreign Airmail \$82.97.
Please allow 6-8 weeks for delivery.

- ☐ Send me 24 issues of *inCider/A+* for \$43.00.
I save 54%!
- ☐ Send me 12 issues of *inCider/A+* for \$27.97.
I save 40%!

Savings based on annual single-copy price of \$47.40.

Name _____

Address _____

City / State / Zip _____

☐ Payment enclosed ☐ Bill me

4JFA6

SAVE 54%!

inCider

A+

Apple II/Macintosh

Please make checks payable to *inCider/A+*.
Basic two-year U.S. subscription price is \$43.00.
All foreign orders must be prepaid in U.S. funds
drawn on a U.S. bank. One year rates: Canada
\$37.97 (price includes GST), Mexico \$37.97,
Foreign Surface \$47.97, Foreign Airmail \$82.97.
Please allow 6-8 weeks for delivery.

- ☐ Send me 24 issues of *inCider/A+* for \$43.00.
I save 54%!
- ☐ Send me 12 issues of *inCider/A+* for \$27.97.
I save 40%!

Savings based on annual single-copy price of \$47.40.

Name _____

Address _____

City / State / Zip _____

☐ Payment enclosed ☐ Bill me

4JFA6

SAVE 54%!

inCider

A+

Apple II/Macintosh

Please make checks payable to *inCider/A+*.
Basic two-year U.S. subscription price is \$43.00.
All foreign orders must be prepaid in U.S. funds
drawn on a U.S. bank. One year rates: Canada
\$37.97 (price includes GST), Mexico \$37.97,
Foreign Surface \$47.97, Foreign Airmail \$82.97.
Please allow 6-8 weeks for delivery.

- ☐ Send me 24 issues of *inCider/A+* for \$43.00.
I save 54%!
- ☐ Send me 12 issues of *inCider/A+* for \$27.97.
I save 40%!

Savings based on annual single-copy price of \$47.40.

Name _____

Address _____

City / State / Zip _____

☐ Payment enclosed ☐ Bill me

4JFA6



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

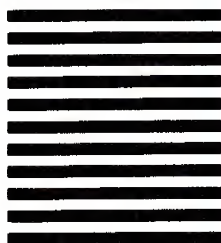
FIRST CLASS MAIL PERMIT NO. 1247 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

inCider/A+

P.O. Box 50358

Boulder, CO 80321-0358



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1247 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

inCider/A+

P.O. Box 50358

Boulder, CO 80321-0358



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 1247 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

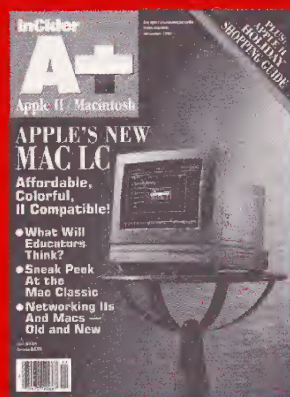
inCider/A+

P.O. Box 50358

Boulder, CO 80321-0358



SAVE 54%



DON'T MISS:

Reviews of educational products
for home and school.

Time-saving hints and techniques.

In-depth articles that help you
stretch your Apple to the max.

Solutions for your personal
finance & home office needs.

Easy and affordable
desktop-publishing projects.

DON'T WAIT.

Order your subscription today

to snuff, but sometimes such error correction can give recorded music an awkward, mechanical feel. To avoid such lifelessness, some sequencer programs can randomize the timing slightly on playback to make the music sound more human. Or, of course, you can just turn quantization off and wing it.

Sequencing options include Diversified Software's GS program **Diversi-Tune** for play-by-car music amateurs. Apple's own sequencing program, **SynthLAB**, came and went in a storm of sound and fury that produced a special tool for GS MIDI programming (**MIDI Synth**) and a beta version that has never been finalized.

SynthLAB turns your GS into a capable synthesizer via the machine's Ensoniq sound chip, and adds a stunted but functional sequencer. It's little more than an electronic multitrack tape deck — you can lay down up to 32 separate tracks, but you can't cut and paste sections, nor can you punch in and rerecord a section; you have to record the whole track over.

One of SynthLAB's strengths is that it can handle MIDI data as a background event with the help of the MIDI Synth tool set, letting you work while your machine plays. MIDI Synth is part of Apple's System 5.0.4 update, and SynthLAB is available from APDA (Apple Programmers and Developers Association) in beta form.

For budding Apple II composers, *transcription programs* — software that lets you enter your music note by note on screen, on traditional staves, and focuses more on music writing than performance — are a must. Activision's **Music Studio** for the GS is a good choice for beginners; it lets you edit each sound as well as your written notes. **Music Writer**, from Pygraphics' Pyware line in versions for the GS and the IIe/IIc, also includes a mini-sequencer and the ability to handle MIDI input; the program can even transcribe your synthesizer's music to a grand staff on screen as you play.

For Mac music buffs, MIDI sequencers range from basic-level programs such as Passport's **Trax**, through more powerful programs such as Intelligent Music's **Jam Factory** and **M**, all the way up to high-end professional packages such as Passport's **Pro4**, Mark of the Unicorn's **Performer**, and Opcode's **Vision**.

MIDI-compatible transcription products for Mac musicians include Electronic Arts' **Deluxe Music Construction Set** for beginners, Passport's **Encore** (which transcribes to an on-screen staff as you play your synthesizer), Mark of the Unicorn's **Professional Composer**, and Coda's **Finale** for high-end projects.

Of the mid-range packages available for the Mac, **ConcertWare+MIDI** from Great Wave Software is one of the most versatile. Most sequencing programs emphasize tracks and measures, but ConcertWare+MIDI lets you work with musical notation.

Once you have your basic song in memory, the software lets you can add dynamic markings, crescendos, repeats, and so on as you see fit, and print your completed score.

ConcertWare+MIDI handles MIDI data flexibly, is especially good at dealing with polytimbral synthesizers, and even includes built-in "instrument maps" of some of the more popular synthesizers. (Each instrument within a synthesizer is assigned a number; an instrument map indicates which instrument within that particular synthesizer model is assigned which number.) The program's patch editor, *Instrument Maker*, offers both graphics-based and numeric control over waveforms and harmonics, and playing with them can be an entertaining lesson in sound theory.

For those of you who want to try your hand at MIDI programming on the Mac, Altech Systems offers a package called **MIDIBASIC**, compatible with both Microsoft BASIC and Zedcor's ZBASIC computer languages.

PUMP UP THE VOLUME

It's true that you can get started making Apple music with just a bare-bones system, and there are a slew of compatible non-MIDI programs out there. Even a IIe can produce some entertaining tunes with a sound card plugged in; the GS is pretty versatile, too, with its built-in 15-voice Ensoniq synthesizer chip.

But if you love music, if you're serious about performance and composition, if you want to experiment with sound and push your instrument to the limit, the MIDI standard (especially for Macs) is the

FURTHER READING

FEATURES

"Making Music," August 1987, p. 38
 "Apple Serenade," May 1988, p. 70
 "Face the Music," October 1989, p. 34
 "Is It Live or Is It Apple II?" August 1990, p. 52

EDITORS' CHOICE

Instant Music, October 1987, p. 144
 Diversi-Tune, September 1988, p. 112
 Sonic Blaster, May 1989, p. 108
 Instant Synthesizer, July 1989, p. 108
 Jam Session, March 1990, p. 108

REVIEWS

Phasor, March 1987, p. 24
 Personal Musician, February 1988, p. 97
 FutureSound, March 1989, p. 32D
 Sound Ace, June 1989, p. 36
 Sonic Blaster, June 1989, p. 36
 Music Writer, June 1989, p. 40
 Music Shapes, June 1989, p. 40
 MasterTracks Jr., June 1989, p. 110
 Instant Synthesizer, September 1989, p. 28
 MasterTracks Pro GS, January 1990, p. 100

LEARNING CURVE

"Music to My Ears," September 1990, p. 88

RESOURCES

Computer Literacy for Musicians

Fred Hofstetter
 \$41 Prentice-Hall

Electronic Musician magazine

P.O. Box 3747
 Escondido, CA 92025-9860

Keyboard magazine

P.O. Box 50404
 Boulder, CO 80321-0404

MIDI for Musicians

Craig Anderton
 \$16.95 Roland Corp. US

Music Through MIDI

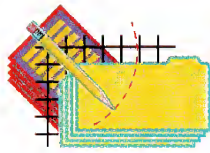
Michael Boom
 \$19.95 Microsoft Press

What's a Synthesizer?

Jon Eiche
 \$5.95 Hal Leonard Books

top of the line and you won't be satisfied with anything less.

So come on! What are you waiting for? There's only one guitar named Lucille, and B.B. King isn't too fond of loaning her out. But plug yourself into a MIDI system, and you can act nonchalant and say things like "Yeah, me and M.C. — we got this MIDI thing down. Yo Apple! Drop the beat!" □



APPLEWORKS IN ACTION

YE OLD TAX TRACKER

Get a head start on next year's return by
using this spreadsheet to track deductible expenses.

By RUTH K. WITKIN

WANT TO KNOW HOW TO BE YOUR own best friend? Keep track of tax-related expenditures all year long, so that when tax time comes you can calmly (calmly?) and rationally (rationally?) project your exposure or prepare your return. For instance, you may need to know how much you spent on medical and dental care, what you paid in state income tax, and your total contributions to charitable causes. All these amounts (and more) are deductible on your income tax return.

Do you think you need a bloodhound to keep track of these items? Not at all. The powerful, easy-to-use spreadsheet in **Figure 1** can do it for you. It takes the amounts you enter and distributes them into 11 tax-deductible accounts, then sums the amounts in each account. (As always, kudos to my favorite tax consultant, George Stein, C.P.A., for expert advice given so graciously.)

A SPREADSHEET FROM SCRATCH

Create a new AppleWorks spreadsheet file named **TAXTRACKER**. The *Review/Add/Change* screen appears with the cursor in cell A1. Create horizontal lines across columns A through R (162 characters). Going the normal AppleWorks route, you'd work in 78-character segments, typing quotation marks before each segment and doing lots of keystroking. There's an easier way: Simply reduce the width of the

columns, enter each line (now shortened considerably) in one step, then widen the columns. Here's how:

1. Narrow the columns: With the cursor on A1, press Open apple-L (OA-L) to start the *Layout* command, type **C** (for *Columns*), press OA-Right Arrow twice, then Right Arrow twice to highlight column R, and hit Return. Type **C** (for *Column width*), press OA-Left Arrow seven times to reduce the highlighted columns to two characters each, and hit Return again.

2. Enter a double line across row 2 in columns A through R: Place the cursor on A2 and type quotation marks to tell AppleWorks that the next character is a label, not a mathematical operator. Hold down the equal-sign key until the sign reaches the right edge of R2, then move the cursor to A6.

3. Enter a single line across row 6 in columns A through R: With the cursor on A6, type quotation marks. Hold down the minus-sign key until the sign reaches the right edge of R6, then move the cursor to A35. Enter a single line in row 35 and hit Return.

4. Widen the columns: With the cursor on A35, press OA-L, type **C**, press Right Arrow 17 times, and hit Return. Type **C**, press OA-Right Arrow seven times, and hit Return again. AppleWorks now "stretches" the line to fill the increased width.

This neat technique really shortens the time it takes to enter long lines. **Tip:** Don't reduce columns to less than two characters wide because AppleWorks won't stretch

a line entered in one-character columns.

Now use the following summary to continue the spreadsheet setup:

Column width. Each column is now a uniform nine characters wide. Use OA-L, *Columns*, and *Column width* as follows: Reduce column A by two characters; column B by three characters; column C by six characters; column F by two characters; and column G by eight characters. Increase column D by 20 characters and column E by two characters.

Column C prevents the right-justified numbers in column B from bumping into the left-justified text in column D, while column G is just wide enough to hold the vertical line separating entries in the tracker from the formulas in the accounts area.

Vertical line. With the cursor in G1, type quotation marks, hit the vertical line (it shares the backslash key), and press Return. Copy the line from G1 into G2 through G36: Leave the cursor on G1, press OA-C, hit Return to confirm *Within worksheet*, and press Return again to confirm G1 as the source. Move the cursor to G2 and type a period, then move the cursor to G36 and hit Return.

Labels and numbers. **Figure 2** shows the sample entries you type, but first here are a few instructions:

- To tell AppleWorks that the *1991* in A4 is a label, not a number, type quotation marks first.

- Do the same in I1, first making sure that columns I, J, and K are on screen so that AppleWorks can accept the entire title.

- In E5, press the spacebar once after typing **Amount**. This space aligns the label with other labels when you right-justify later.

To speed things up, turn off automatic calculation: Press OA-V and type **RFM** (for *Recalculate Frequency Manual*).

Now enter the labels and numbers. After typing each entry, just move the cursor to the next cell needing an entry. This serves the same purpose as pressing Return, and saves one keystroke every

TAX DEDUCTION TRACKER						1991 DEDUCTION ACCOUNTS										
4/1/91	Check	Check or	Allocated	Acct		Medical	Med/Dent	Dental	Mortgage	Personal	State	Invest	Moving	Unreimb	Misc	
5/Date	Number	Issued To/Allocation	Amount	Code		Payment	Premium	Payment	Contrib	Interest	Prop Tax	Inc Tax	Interest	Exp	Exp	Exp
7/Jan 1	422	Blue Star Medical Insurance	456.72	2	1	456.72										
8/Jan 2	423	County Personal Property Tax	25.00	6	1					25.00						
9/Jan 2	424	Shoreline/Mortgage Interest	778.54	5	1					778.54						
10/Jan 2	425	American Red Cross	50.00	4	1			50.00								
11/Jan 2	426	Professional Salesperson Assn	125.00	11	1										125.00	
12/Jan 5	427	Dr. David Campbell	75.00	1	1	75.00										
13/Jan 5	428	VistaCard/Business Entertain	121.98	10	1									121.98		
14/Jan 10	434	Shoreline Trust Safe Deposit	34.00	11	1										34.00	
15/Jan 12	437	Romer Health Pavilion	25.00	1	1	25.00										
16/Jan 12	438	JJ Brokerage	40.00	8	1								40.00			
17/Jan 25	442	PWC	75.00	4	1			75.00								
18/Feb 2	444	Shoreline/Mortgage Interest	778.05	5	1					778.05						
19/Feb 3	445	VistaCard/Amer Air-Cleveland	200.00	10	1										200.00	
20/Feb 17	449	VistaCard/Hotel Cleveland	132.00	10	1										132.00	
21/Mar 2	456	Shoreline/Mortgage Interest	777.55	5	1					777.55						
22/Mar 15	462	AmExpress/Business Entertain	112.00	10	1									112.00		
23/Mar 17	463	Est State Tax Installment	150.00	7	1						150.00					
24/Mar 26	465	Dr. Bernice Hardwick	278.00	3	1	278.00										
25/Mar 26	467	Romer Boys Club	25.00	4	1			25.00								
26/Apr 2	469	Shoreline/Mortgage Interest	777.05	5	1					777.05						
27/Apr 4	470	Balance 1991 State Tax	125.00	7	1						125.00					
28/Apr 4	471	Blue Star Medical Insurance	456.72	2	1	456.72										
29/Apr 7	472	Dr. Bernice Hardwick	75.00	3	1	75.00										
30/May 2	489	Shoreline/Mortgage Interest	778.54	5	1					778.54						
31/May 23	495	George Stein, C.P.A.-Tax Prep	165.00	11	1										165.00	
32/Jun 2	499	Shoreline/Mortgage Interest	776.03	5	1					776.03						
33/Jun 15	503	Est State Tax Installment	150.00	7	1						150.00					
34																
35																
36		Totals	7,463.76	2	1	100.00	913.44	383.00	150.00	4,663.76	25.00	425.00	40.00	0.00	565.98	324.00

Figure 1. Completed tax-tracker spreadsheet. Highlighted areas show locations of formulas.

TAX DEDUCTION TRACKER						1991 DEDUCTION ACCOUNTS										
4/1/91	Check	Check or	Allocated	Acct		Medical	Med/Dent	Dental	Mortgage	Personal	State	Invest	Moving	Unreimb	Misc	
5/Date	Number	Issued To/Allocation	Amount	Code		Payment	Premium	Payment	Contrib	Interest	Prop Tax	Inc Tax	Interest	Exp	Exp	Exp
7/Jan 1	422	Blue Star Medical Insurance	456.72	2	1											
8/Jan 2	423	County Personal Property Tax	25.00	6	1											
9/Jan 2	424	Shoreline/Mortgage Interest	778.54	5	1											
10/Jan 2	425	American Red Cross	50.00	4	1											
11/Jan 2	426	Professional Salesperson Assn	125.00	11	1											
12/Jan 5	427	Dr. David Campbell	75.00	1	1											
13/Jan 5	428	VistaCard/Business Entertain	121.98	10	1											
14/Jan 10	434	Shoreline Trust Safe Deposit	34.00	11	1											
15/Jan 12	437	Romer Health Pavilion	25.00	1	1											
16/Jan 12	438	JJ Brokerage	40.00	8	1											
17/Jan 25	442	PWC	75.00	4	1											
18/Feb 2	444	Shoreline/Mortgage Interest	778.05	5	1											
19/Feb 3	445	VistaCard/Amer Air-Cleveland	200.00	10	1											
20/Feb 17	449	VistaCard/Hotel Cleveland	132.00	10	1											
21/Mar 2	456	Shoreline/Mortgage Interest	777.55	5	1											
22/Mar 15	462	AmExpress/Business Entertain	112.00	10	1											
23/Mar 17	463	Est State Tax Installment	150.00	7	1											
24/Mar 26	465	Dr. Bernice Hardwick	278.00	3	1											
25/Mar 26	467	Romer Boys Club	25.00	4	1											
26/Apr 2	469	Shoreline/Mortgage Interest	777.05	5	1											
27/Apr 4	470	Balance 1991 State Tax	125.00	7	1											
28/Apr 4	471	Blue Star Medical Insurance	456.72	2	1											
29/Apr 7	472	Dr. Bernice Hardwick	75.00	3	1											
30/May 2	489	Shoreline/Mortgage Interest	778.54	5	1											
31/May 23	495	George Stein, C.P.A.-Tax Prep	165.00	11	1											
32/Jun 2	499	Shoreline/Mortgage Interest	776.03	5	1											
33/Jun 15	503	Est State Tax Installment	150.00	7	1											
34																
35																
36		Totals														

Figure 2. Labels and numbers to type into tax-tracker spreadsheet.

time. When you're finished, press Return.

Formats. Use the Value command (OA-V) to set a standard *Value format* of *Commas* with two decimal places. Next, use the *Layout* command (OA-L) and *Block* to reformat the cells in rows 7 through 34 of columns B (*Check Number*) and F (*Acct Code*) to show *Commas* with no decimal places. Also use OA-L and *Block* to reformat H5 through R5 with *Appropriate*. Use OA-L and *Label format* to right-justify E3 through F5, H3 through R4, and D36. Now press OA-S to store all your work on disk.

Columns A through F are similar to a

standard check ledger. They contain dates, check numbers, payees, amounts, and account numbers. The check numbers are only for reference. The account numbers determine the category into which the check amount is placed eventually. That's where the similarity ends.

Here, you're not interested in every check written, only those fitting into tax-deduction accounts. For instance, you'll enter medical payments and charitable contributions, and omit checks for disability insurance and IRA contributions. Also, you're not concerned with the

entire check amount, only that portion allocated to a tax-deductible account; you'll enter the entire Blue Star Medical Insurance check (#422), but only the interest part of the Shoreline Trust mortgage-payment check (#424). The slash after *Shoreline* indicates a partial amount.

Accounts 1 through 10 follow the IRS pattern and are self-explanatory. The *Misc Exp* account in column R holds such diverse items as union dues, business- or professional-association dues, work clothes, the cost of looking for a new job, job-agency fees, tax-advice and -preparation fees, and rental of a safe-deposit box. All these items, plus unreimbursed employee expenses (which appear here in their own column, but are normally part of *Misc Exp*) are subject to the 2 percent floor.

Please note that not every conceivable deduction that could be taken on a tax return is mentioned here. Consult your tax adviser for any additional deductions to which you may be entitled. At the end of this article I describe how to add columns to hold them.

Now enter the formulas that perform the calculations in columns H through R and in row 36. First read how the formula works, then place the cursor on the cell receiving the formula. Move the cursor to the cell location shown in the formula and type everything else.

When the formula is complete, compare each character on your screen with the way it appears here. If everything agrees, press Return. If something's amiss, press Escape and start again.

FORMULA 1: Medical Payment

Cell location: H7

Formula: @IF(F7=H5,E7,"")

Formula 1 either enters the check amount or makes the cell appear empty (as it does in H7). The *Test* statement compares the account number (F7) with the account number in the column heading (H5). If they match, the *Then* statement copies the amount in E7 and enters it in its cell. No match, and the *Else* statement enters double quotation marks, essentially making the formula "disappear."

Copy Formula 1 into the cells to the right, where each can match its own account number in the column heading to the account number in column F: Leave the cursor on H7 and press OA-C. Press

Return twice (to confirm *Within worksheet* and *Source*). Move the cursor to I7, type a period, move the cursor to R7, and hit Return again. AppleWorks pauses with a highlight on F7 in the entry line, asking you to identify F7 as a *No change* (absolute) or *Relative* reference in its copied location. F7 and E7 are absolute, while H5 is relative, so press Return, type **R**, and hit Return again. Press OA-K to recalculate, which makes 456.72 appear in I7.

Now copy that row of Formula 1s down their respective columns: With the cursor on H7, press OA-C and hit Return. Move the highlight to R7 and hit Return again. Press Down Arrow, type a period, move the highlight to H34, and hit Return.

Again, AppleWorks asks you to identify absolute and relative cell references. This time type **R**, press Return, and type **R** again. As AppleWorks highlights each formula, hit the same keys: **R**, Return, and **R**. Now press OA-K again to display the numbers.

Compare your results with those in **Figure 1**. If there's no match, check the construction of Formula 1 in H7, re-entering the formula and repeating the copy instructions if necessary. Now protect Formula 1 and all its incarnations: Place the cursor on H7 and press OA-L. Type **B**, press OA-8, then Down Arrow four times to reach H34. Then hit OA-Right Arrow once and Right Arrow enough times to reach column R. Hit Return, then type **PN** (for *Protection Nothing*).

FORMULA 2: Total Amount

Cell location: E36

Formula: @SUM(E35..E6)

Formula 2 adds the amounts in E34 through E7 to produce the total in E36. The formula includes the lines in E35 and E6 to create a solid range. If you later insert new rows anywhere in this range, AppleWorks adjusts the cell references to add the new entries along with the old.

Now copy Formula 2 into the account-total cells to the right: With the cursor on E36, press OA-C and hit Return twice. Move the cursor to H36, type a period, move the cursor to R36, and hit Return again. Press OA-R twice to tell AppleWorks both cells are relative. Press OA-K. Now protect these formula cells: Leave the cursor on E36 and press OA-L. Type **R** (for *Rows* — it doesn't matter that blank cells and the vertical-line cell G36 are

included), and hit Return. Type **PN**. Press OA-S to store your work on disk.

YES, IT DOES WINDOWS

When you work on a spreadsheet as wide as this one, a second window that lets you view two diverse areas is a must. To see how this works, press OA-1, then position the spreadsheet so that column E (*Check or Allocated Amount*) is the first column on the screen. Now place the cursor in column H, press OA-W, and hit Return to confirm *Side by side*. AppleWorks creates two windows instantly — one containing amounts and accounts, the other containing account categories 1 through 5.

Suppose you want to see account 10, which should reflect the amount in F13: Press OA-Right Arrow twice, and there, in Q13, is 121.98. Scan categories 6 and 8, and you can see other amounts in their proper places. If you wanted to make changes in the amount or account, you could jump back and forth between the windows by pressing OA-J. Reunite the windows by pressing OA-W and hitting Return (for *One*).

This spreadsheet is 163 characters wide, and prints on two sheets of paper. Press OA-O to bring up the *Printer Options* screen. To print as much as possible on the first sheet, choose a smaller character size: Type **CI** (for *Chars per Inch*) and press Return. Type **17** and hit Return again.

Next, set the margins: Type **LM** (for *Left Margin*), press Return, type **.3**, and hit Return again. Now type **RM** (for *Right Margin*), press Return, type **.3**, and hit Return. Finally, type **TM** (for *Top Margin*), press Return, type **.3**, and hit Return once more. Press OA-S to store this final version on disk, and to return the spreadsheet to the screen.

Turn on your printer and make a hard-copy of your spreadsheet: Leave the cursor where it is and press OA-P to bring up the *Print* screen. Hit Return to confirm *All*. Press Return to select the printer (or type a printer number, then Return), type today's date (or, if your computer has a clock, type an asterisk @ to have AppleWorks enter the date for you), and hit Return twice. The printer chugs away, producing the spreadsheet.

The best time to add more entry rows is when you're down to your last empty one.

You can copy this row (with its formats and formulas, but without entries) to the clipboard, then copy it back into the spreadsheet. On this spreadsheet you've filled every available row but row 34. Here's how to use it to expand the entry section:

1. Place the cursor on A34 and press OA-C.
2. Select *To clipboard* and hit Return twice (to confirm *Rows*).

3. Leave the cursor on A34 and press OA-C again. This time select *From clipboard*, then confirm *Formulas and values*.

AppleWorks now inserts a brand-new row, ready for new entries. You can copy from the clipboard as many times as you want new rows and, each time you do, AppleWorks adjusts the cell references in the SUM formulas to include the new rows.

If you need more account categories, the easy approach is to add them after the last category. Here are the steps:

1. Place the cursor on R1 and press OA-C.
2. Select *To clipboard*, type **C** (for *Columns*), and hit Return.

3. Leave the cursor on R1 and press OA-C again. This time select *From clipboard* and confirm *Formulas and values*.

4. Enter a new account name and number in the heading, and press OA-K to recalculate.

You can copy from the clipboard as many times as you want new accounts. Keep in mind that entries in columns B and F are in a nonstandard format, which means that blanking them also blanks out their format. While this isn't the end of the world, reformatting them takes time. To avoid extra work, otype (don't blank) and check numbers and account codes when editing this spreadsheet.

NEXT MONTH

If you're responsible for assigning people to client projects, allocating time for project phases, and coming up with a cost estimate, be sure to check out the project cost-estimate spreadsheet in next month's column. □

CONTRIBUTING EDITOR RUTH K. WITKIN IS THE AUTHOR OF THE *SUCCESS WITH APPLEWORKS* TEMPLATE SERIES (IN CIDER/A+, IDG COMMUNICATIONS/PETERBOROUGH) AND *RUTH WITKIN'S NEW APPLEWORKS TEMPLATES* (QUALITY COMPUTERS). WRITE TO HER AT 5 PATRICIA STREET, PLAINVIEW, NY 11803. ENCLOSE A SELF-ADDRESSED, STAMPED ENVELOPE IF YOU'D LIKE A REPLY.

In a world
where finding
Apple II[®]
hardware, software and
support is difficult,
it's nice to know
there is
one number
that can help
you find
it all.

1-800-443-6697 - Introdu

Order it today Have it tomorrow

We are pleased to introduce "Apple II® Overnight™", the best sales and support system for any computer — created just for you and your Apple II. It's brought to you exclusively by Quality Computers, America's largest Apple II hardware and software dealer.

What is Apple II Overnight?

Apple II® Overnight is a comprehensive sales, service and support system for you, the Apple II user.

Apple II® Overnight offers you one-stop shopping for all your Apple II needs. Everything in our extensive catalog is just a phone call away — computers, hard drives, memory cards, modems, disk drives, monitors, and accessories — including genuine Apple® products.

Do you need software? We have thousands of titles from publishers like Q Labs, Broderbund, Vitesse, Claris, MECC, Beagle Bros, and much more. All Apple II. All at incredible prices. All just a phone call away. All in stock and ready for next day delivery. (See pages 2-5 of this issue)

The service you deserve

When you are having a problem with hardware or software, you don't want to wait. You want to be up and running ASAP.

That's why we offer a 48-hour replacement service. Should you have a problem with any product you buy from us, just call. We can pick it up and get a replacement to you within 48 hours — at a price you can live with.

The support you need

Even computer experts use technical support networks. And at Quality Computers, we have one for you, whether



you're an expert or a beginner. You can count on us for the best technical support in the Apple II industry.

Our staff can help you tackle any hardware or software problem you may be having. They know all that stuff about incompatibility, bad blocks, error messages and other signs of trouble. With a couple of handy tips you'll be up and running — and a little smarter.

Plus a bonus!

After you place your order, we keep in touch even if you don't. That's because every Quality Computers customer receives *Enhance*, our free, informative, entertaining, techni-

cing Apple II® Overnight



cal newsletter every other month. *Enhance* contains all the information you need to get the most out of your Apple II.

Special features of *Enhance* include Technical Tips, Enhancing Education, Computer Club Corner, Product Reviews, and New Products. *Enhance* also contains our extensive catalog of Apple II hardware and software, valuable money-saving coupons, classified ads, and more!

Our qualifications

Experience. We've been in the Apple II industry for over seven years. We know the industry. We know the machine. We know the people.

Knowledge. Since 1984 we have dedicated part of our company to product research and manufacturing. We currently publish several successful software products for the Apple II.

We also manufacture our own line of hard drives as well as publish *The Hard Drive Buyer's Guide*.

Dedication. We stand behind your Apple II. We know that it's a versatile, friendly machine that is wonderful for home and school use. We also know that there are over 6,000,000 Apple II users out there that need the kind of service and support that only we can give.

Our customer

We are here to service the Apple II community. A community of school and home users that rely on the Apple II for education, productivity, and reliability. A community that deserves the support of a full-time, full-service Apple II company like Quality Computers.

What do you need?

Perhaps you've never seen so much Apple II support in one place. You may be a little surprised, considering the lack of Apple II products carried by most local dealers. So take a minute and think about what we can do for you.

Then call. It won't cost you a thing. Just dial 1-800-443-6697 or write to the address below. Let us know what you want from your Apple II. Then let us do it for you.



Quality Computers

POWER FOR PERFORMANCE

20200 Nine Mile Rd. • Box 665 • St. Clair Shores, MI 48080

Apple II Overnight is a trademark of Quality Computers, Inc. Apple is a registered trademark of Apple Computer, Inc.



PRESS ROOM

DESKTOP-PUBLISHING STAR SEARCH

Two *inCider/A+* readers capture the spotlight
with projects they've designed themselves.

By CYNTHIA E. FIELD, Ph.D.

HERE AT *INCIDER/A+*, WE DON'T believe in keeping talent a secret — especially when it comes to great desktop-publishing projects. After all, hidden talent is nothing more than a waste of a good idea. So let's take a look at two projects *inCider/A+* readers shared with us recently. First we'll show you how to create an elegantly printed program for a wedding — or any special occasion, for that matter. Practically all you need is a glue stick. Next we'll re-create letterhead and envelope templates designed by a professional photographer. Whether you need personalized stationery for friendly letters

or business correspondence, these templates will get you off to a quick start.

PRECIOUS MEMORIES

If you've ever planned a wedding, you know that you must arrange most details months in advance. When Edward Girard's fiancée, Julie, suggested just a few weeks before their ceremony that they provide wedding programs to their 200 guests, Girard might have panicked, but he didn't even flinch. Girard not only knew that **Publish It! 3** was equal to the task, he figured that producing the booklet themselves would save money as well as time. How right he was!

"Julie created a few samples by hand to

give me an idea how she wanted the program to look," says Girard, who prepared the publication's text with the **AppleWorks 3.0** word processor. After saving the word-processing file on a data disk, he started up **Publish It! 3**, added a couple of pages to the layout (*Page* menu), drew a text frame on each page (text tool), and then linked the frames (linking tool) to accommodate his imported **AppleWorks** file (*File* menu).

Like many brides, Julie opted for an elegant script-like font, and she wanted some artwork on the program's cover. Girard chose the *Kenilworth* typeface from Timeworks' **Font Pack 1**, a **Publish It!** accessory product. He used the 36-point size for headings and the 18-point size for body text. The "lovebirds" illustration came from Dover's **Ready-to-Use Wedding Illustrations**. (See **Figure 1**.) Employing special fonts with **Publish It! 3** is easy. Use the *Install Font* option listed in the *Apple* menu. In the publication-in-progress select the desired text with the mouse. Pull down the *Font* menu and choose *Select Font*.

Formatting is even simpler. Select the text, pull down the *Format* menu, and choose *Justification*. That's how Girard arranged his program, including the centerfold featuring short "biographies"

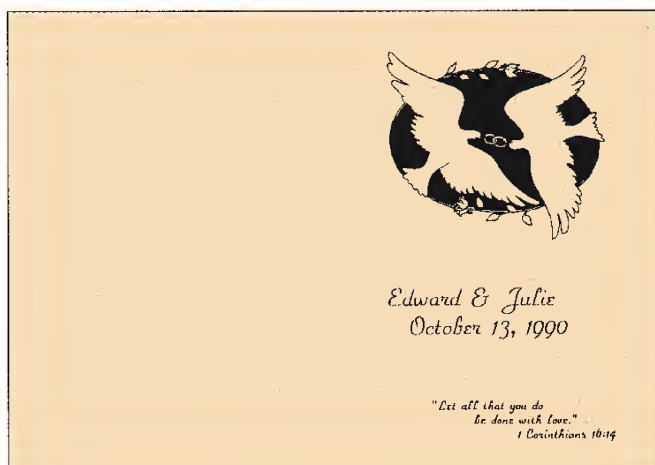


Figure 1. Placement of cover elements on photocopying master. The blank left-hand side forms the eighth page of the booklet; the right-hand side forms the cover.

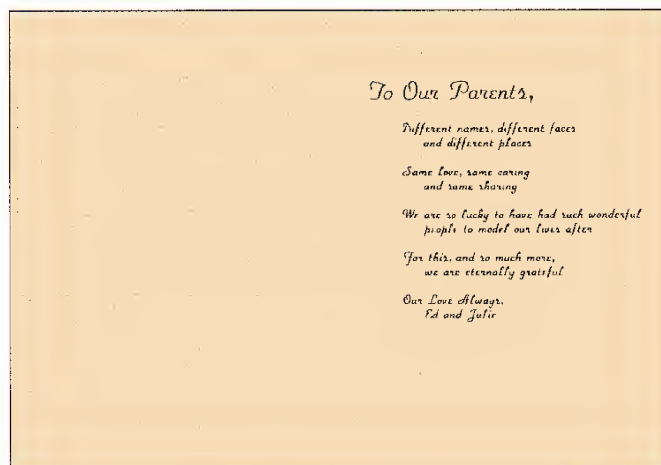


Figure 2. Girard glued the dedication on the back of **Figure 1**. After folding the pages into a 5.5-by-8.5-inch booklet, the left side forms page 2 and the right side forms page 7.

of the wedding party. (See **Figures 1-4.**)

Girard saved his publication on disk and printed it on a dot-matrix printer in Publish It! 3's best-quality mode. To further enhance appearance, he photocopied the pages at 80-percent reduction, which smoothly blended the dots making up each character. Next he separated the text areas with an X-acto-type knife and glued the panels in proper sequence onto both sides of two blank 8.5-by-11-inch sheets of paper. **Figures 1** and **2** make up the front and back of one master sheet, and **Figures 3** and **4** make up the front and back of the second master sheet.

After photocopying these masters onto ivory-colored, linen-textured paper, Girard folded and stapled the sheets into two-page 5.5-by-8.5-inch programs. (The blank left-hand side of **Figure 1** forms the eighth page of the booklet; the right-hand side forms the cover. The left-hand side of **Figure 2** forms the second page of the program; the right-hand side forms the seventh page. The right- and left-hand sides of **Figure 3** become pages three and six of the wedding program. **Figure 4** forms the centerfold, pages four and five.) "Everyone thought the programs were done professionally," says Girard. "They certainly added an impressive touch to our wedding."

PICTURE THIS

Indiana reader Don Wood wasn't the photographer hired to shoot Edward and Julie's wedding in Texas, but he's logged many such occasions. For nearly a quarter century, Wood has been a professional

OBJECT	LEFT START	TOP START	WIDTH	HEIGHT	OTHER SPECS
Letterhead Objects					
GRAPHICS FRAMES:					
Camera (left)	0.213	0.147	1.851	1.111	
Camera (right)	5.463	0.209	1.851	1.111	
TEXT FRAMES:					
"Group Photography" label	0.250	0.795	1.795	0.388	
Phone label	0.230	1.372	1.241	0.297	
Name and address	2.815	0.201	2.163	1.872	Transparent
"For the people" label	5.281	0.869	1.277	0.388	
Main letter area	0.250	2.165	7.245	7.630	
SHAPES:					
Round corner box	2.758	0.109	2.222	1.093	50% Fill
Thick rule	0.229	2.250	7.281		Line Weight #3
Envelope Objects					
GRAPHICS FRAMES:					
Apple IIgs graphic	0.113	1.350	2.041	1.750	
Camera graphic	0.506	1.608	1.048	0.647	
TEXT FRAMES:					
Return-address label	0.138	0.370	2.379	0.929	
"Apple IIgs" label	0.490	2.393	1.102	0.240	
Addressee panel	3.579	2.125	4.000	1.000	

Table. Specifications for Don Wood's letterhead and envelope templates (in inches).

photographer at the "Photos by Don Wood" studio in Madison, Indiana. He also works full-time at the *Madison Courier*.

When he's not busy playing photographer, Wood turns to Publish It! 3 to design creations for his studio and his parish church's Knights of Columbus council. But Wood's letterhead and envelope templates impress us most, because they'll appeal to anyone who wants to spiff up correspondence the easy way. In the accompanying **Table** we provide the specifications for Wood's letterhead and envelope projects.

Copying the letterhead design takes less than a half-hour. (See **Figure 5.**) Start

up Publish It! 3 and press Open apple-4 (OA-4) to work in *Size to Fit* mode. You'll use a half-dozen tools for this project, including the pointer, the graphics frame tool, the text tool, the I-beam, the round-corner box tool, and the line tool.

As your design progresses, you'll want to switch from one viewing mode to another. Use the *Special* menu to choose the magnification you want, or try memorizing the faster keyboard commands OA-1 (*Show Full Size*) through OA-4.

To begin, select the proper tool, draw the object, and make it conform to Wood's design. Select the object (click on it with

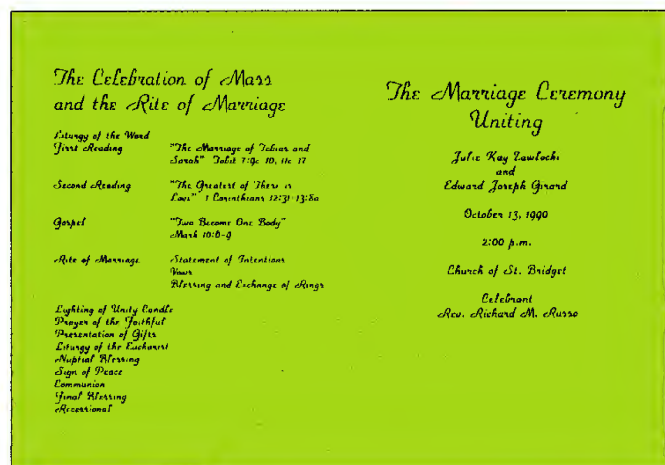


Figure 3. The text glued to the right- and left-hand sides of this master page become pages three and six of the wedding program.



Figure 4. Girard glued the names of the wedding party to the back of Figure 3 to form pages four and five (the centerfold) of the master copy.

the pointer) and press OA-M, or pull down the *Objects* menu and choose *Show Specifications*. Edit the dimensions in the dialog box to match those in the **Table**.

The letterhead template shows off some special Publish It! 3 features. For one, the text frame containing the studio's name and address is transparent. (Click on *Transparent* in the object's *Show Specifications* dialog box). A transparent text frame prevents the rounded rectangle from masking the studio's name, or vice versa; instead, the shape shows through to enhance the text.

Wood chose the outline type style (*Font* menu) to make his company's name stand out on its shaded background. He selected the 50% Fill swatch from the pattern palette (*Objects* menu) before drawing the round-corner box.

Create the rule separating the letterhead area from the main text area below by selecting the third thickest line weight (#3) in the *Set Line Weight* dialog box (*Objects* menu). Then draw the line with the line tool. Drag the line into position with the mouse, or use *Show Specifications* and the **Table** data to snap the line into place automatically.

When your letterhead design's completed, save it as a template on a data disk. Print a copy using Publish It!'s double-strike printing mode, and consider duplicating the letterhead with a photocopier. That way, you can use it not only with your desktop-publishing program, but with a word-processing program such as AppleWorks. Just friction-feed a sheet of letterhead into your printer and advance the page so that the printhead's just below the preprinted area.

As an alternative, write your letters with Publish It! 3. Open the letterhead template, insert the I-beam into the large text frame, select a font, and type away. Better yet, compose your letter with the AppleWorks word processor, look over your typing with that program's spell checker, save the file, then import it into the Publish It! letterhead template. If you

plan to save a copy of the letter on disk, select the *Save As* feature (*File* menu) and type a unique name.

As the screen dump shows, Don Wood's envelope template consists of a graphics area and two text frames. (See **Figure 6**.) One text frame accommodates the return address, the other the recipient's address. Wood designed a fairly complicated illustration for his envelope. Onto the underlying computer clip art he superimposed a second graphics frame with a camera graphic and a text frame with the label "Apple IIGS." Your design needn't be that elaborate, but it's fun to explore the possibilities anyway. When your envelope template's completed, save it with a meaningful name on a data disk.

Prepare a batch of preprinted envelopes like the one shown in **Figure 7**. Later on add the recipient's address with a typewriter, or use Publish It! to address a custom envelope for each letter you write.

First, open the template, insert the I-beam into the addressee panel, and enter the recipient's name and address. Thanks to Publish It! 3's Clipboard, you can even copy (OA-C) the recipient's address from the letter, close the letter file, open the envelope template, and paste (OA-V) the address into the addressee panel. Why type the same thing twice? Experiment with various fonts and formatting options before printing your envelopes. We discovered that centered addresses are a nice touch.

Insert a #10 business envelope into the printer as you would an ordinary sheet of paper. Line up the left edge of the envelope with the single-sheet icon on the ImageWriter II's back cover and press the form-feed button once to advance the envelope to the top-of-page setting. Because most envelopes are thicker than computer paper, you may want to move the printer's paper-thickness lever down a notch or two to prevent jamming. Use similar methods to orient

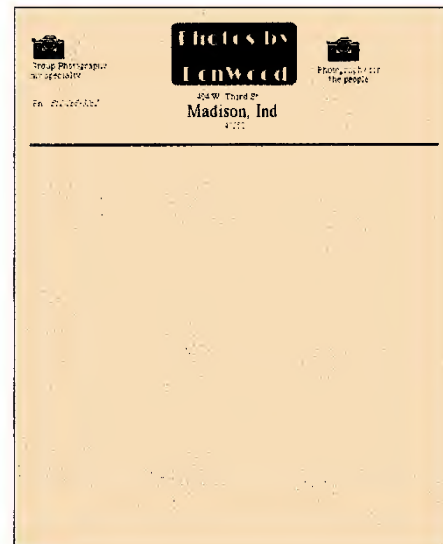


Figure 5. Don Wood's letterhead.

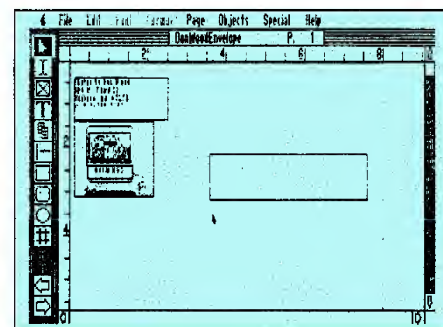


Figure 6. Screen dump showing Don Wood's envelope design with addressee-panel text frame.

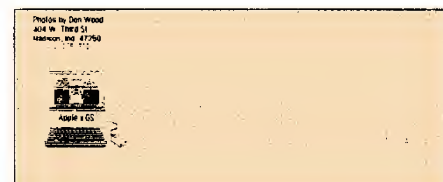


Figure 7. Don Wood's envelope design.

envelopes in other printer models.

Whether you're planning a special celebration or designing custom stationery, Publish It! 3 and an Apple II are the perfect match. If you've created something special with your Apple II or Macintosh and would like us to consider sharing it with other Press Room readers, send us printouts and a copy of the file(s) on disk. Include a cover letter telling us a little bit about your project. We'll drop you a line to let you know what we think.

Who knows? We might even design a new letterhead template just for the occasion! □

WRITE TO CYNTHIA E. FIELD AT 60 BORDER DRIVE, WAKEFIELD, RI 02879. ENCLOSE AN SASE IF YOU'D LIKE A PERSONAL REPLY.

PRODUCT INFORMATION

AppleWorks 3.0

Claris Corporation
5201 Patrick Henry Drive
P.O. Box 58168
Santa Clara, CA 95052-8168
(408) 727-8227
\$249

Publish It! 3, \$129.95

Font Packs 1 and 2,
\$39.95 each
Timeworks Inc.
625 Academy Drive
Northbrook, IL 60062
(708) 559-1300

Ready-to-Use

Wedding Illustrations
Dover Publications
31 East 2nd Street
Mineola, NY 11501
(516) 294-7000
\$3.95

YOU ASKED FOR IT.

- YOU WANTED FAS-TRACK'S TOLL-FREE TECH SUPPORT.
- YOU WANTED SCHOOL PO's WELCOME.
- YOU WANTED 30-DAY UNCONDITIONAL MONEY-BACK GUARANTEE.
- YOU WANTED FAS-TRACK'S PRICE MATCH. Call for details.
- YOU WANTED FAS-TRACK'S GIANT FREE CATALOG.

YOU GOT IT!

FAS-TRACK DELIVERS!

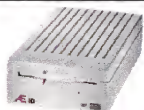
TransWarp GS



Increase the speed of your IIGs to 7MHz, compared to the IIGs's native 2.6. Now the accelerator board that brought thousands of IIGs's up to speed is even faster. The 32K cache option boosts the TransWarp GS 20% to 50%.

TransWarp GS w/8k cache	\$219.95
TransWarp GS w/32k cache	\$294.95
TransWarp GS upgrade	\$86.95
Other Applied Engineering Products	
GS Ram III w/1 Meg	\$159.95
GS Ram III w/2 Meg	\$214.95
GS Ram Plus w/1 Meg	\$199.95
GS Ram Plus w/2 Meg	\$249.95
TransWarp IIE (4 mhz)	\$94.95
RamWorks III w/256K	\$139.95
Vulcan 20 Meg Drive	\$499.95
Vulcan 40 Meg Drive	\$649.95

AE 3.5" Daisy-Chain Drive



800K **\$187**
1.6 Meg **\$249**
IIE UDC Card **\$40**

Zoom 2400B Modem Pack-



Package includes Zoom MX 2400 baud external modem, Beagle Brothers Point-to-Point Communications software, Compuserve and Genie starter Kits and more. Compatible with Apple IIE, IIC, IIGs, and Laser 128 series **\$134.95**

Memory Chip Upgrades

256K x1 Drams (8 - 120ns)	\$19.95
1 Meg x 1 Drams (8 - 100ns)	\$54.95
1 Meg x 8 SIMMs (80 ns)	\$54.95

Chinook GS4000 Ram Card



Add as much as 4 meg to your Apple IIGs. 100% compatible with all applications. 1 year warranty.

GS4000 w/1 Meg	\$139.95
GS4000 w/2 Meg	\$189.95
GS4000 w/4 Meg	\$289.95

Productivity Software

AppleWorks 3.0	\$169.95
AppleWorks GS 1.1	\$199.95
HyperStudio 2.1 (IIGs)	\$89.95
Quicken	\$37.95
ProTERM	\$79.95
Copy II Plus 9.1	\$24.95
Prosel 16 (IIGs)	\$72.95
Cross-Works	\$69.95
Vitesse Salvation Series (IIGs)	\$119.95
Vitesse Harmonie	\$29.95

Zip IIGs

GSX1500-7mhz, 8k cache	\$149.95
GSX1600-8mhz, 16k cache	\$199.95
GSX1800-9mhz, 16k cache	\$229.95

Laser Computers

Laser 128 w/RGB mon	\$499.95
Laser 128EX w/RGB mon	\$579.95
Laser 190A Printer	\$174.95
(Laser Computer prices include freight)	

Other Hardware

ComputerEyes IIGs	\$194.95
Lightning Scan IIGs	\$199.95
IIE 80 Column 64K Card	\$24.95

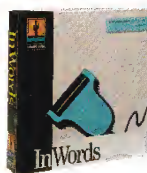
Vitesse Quickie Scanner



Quickie 400DPI Handscanner for Apple IIE & IIGs includes new 16 gray shade software **\$194.95**

Quickie & InWords Package **\$269**

InWords OCR Software



InWords OCR software allows you to scan text and use it with AppleWorks and other applications. **\$79.95**

Edu-Tainment Software

Childrens' Writing & Publishing Center	
	\$34.95
Oregon Trail	\$24.95
Word, Number Munchers	ea \$24.95
Think Quick	\$29.95
Mavis Beacon Typing (IIE)	\$25.95
Mavis Beacon Typing (IIGs)	\$31.95
Computer SAT or ACT	\$29.95
Chessmaster 2100 (IIE or IIGs)	\$31.95
Maniac Mansion	\$14.95
Tetris (IIE and IIGs)	\$24.95
Task Force (IIGs)	\$24.95

GeoQuiz and GeoPuzzle



Two geography titles for Apple II. GeoQuiz (IIGs only) \$29.95 GeoPuzzle (IIE or IIGs) ea \$24.95

Publish It!4



New and improved version of the number one selling Apple IIE and IIGs DTP Program **\$77.95**

4 In One Art Portfolio **\$79.95**

Print Shop Companion IIGs



Apple IIGs **\$29.95**

Print Shop IIGs **\$35.95**

Other Broderbund Titles

The New Print Shop	\$29.95
Banner Mania	\$21.95
Where in Time	\$27.95
Where in the World	\$25.95
Where in the USA	\$27.95
Where in Europe	\$27.95
The Playroom	\$25.95
Prince of Persia	\$21.95
Beagle Brothers Software	
Platinum Paint (IIGs)	\$59.95
AW 3.0 Companion Plus	\$29.95
T.O. TextTools, Thesaurus	\$30.95
T.O. Superfonts	\$42.95
T.O. Sidespread	\$30.95
T.O. SuperForms, Outliner	\$43.95

Accessories



IW Black Ribbon 1-5 **\$2.95** 6+ **\$2.25**
IW 4-Color 1-5 **\$6.50** 6+ **\$5.45**

10 DS/DD 3.5" Disks	\$5.50
10 High Density 3.5" Disks	\$10.50
25 DS/DD 5.25" Disks	\$8.25



FAS-TRACK
COMPUTER PRODUCTS

CALL TOLL-FREE 1-800-272-1600



1-614-847-4050 (central Ohio)
1-614-847-4180 FAX

MON—FRI 9 AM TO 8 PM/SAT 10 AM TO 5 PM (EST)

We accept MasterCard, VISA, and Discover Card—no extra charge. School purchase orders welcome. Continental U.S., F.P.O., and A.P.O., add 4% (minimum \$4.00 for each shipment). AK, HI, PR, VI, and Canada, add 5% (minimum \$10). International orders, except Canada, will be shipped priority mail insured and charges will be added to your order. No C.O.D. Ohio residents add 5.75% Sales Tax. Please, no returns without prior authorization. All products have a 30 day unconditional money back guarantee. Shipping charges are not refundable. Prices and availability are subject to change without notice.

7030 C HUNTLEY ROAD • COLUMBUS, OHIO 43229

Circle 85 on Reader Service Card.



APPLESOFT ADVISER

BIT-MAP ATTACK

**What good are all those graphics images
if you have to annotate them from the text window?**

By DAN BISHOP

YOUR MONITOR SEEMS TO SNEER as you look up blearily from the program you've been slaving over for weeks. On screen, four images of temptingly realistic fruit rotate slowly. Your instructional program on the mangoes of Southern Fiji is perfect, except for one detail: You need to label the drawings — but all you have to work with is the four-line text window at the bottom of the screen. Your hands crash down on the keyboard in frustration, sending up a shower of Doritos and splinters of plastic. You're a master of graphics programming, but the ability to place text in a graphics window remains beyond your reach.

Last time, in "Smashing the Hi-Res Barrier" (April 1991, p. 70), you learned a method for converting the high-resolution page 2 graphics screen to mixed text-and-graphics mode and to POKE text into memory so that it would appear in this window.

This month we'll throw mixed mode out the window (pun intended) and develop a method for creating text anywhere on the graphics screen, so that you can use full-screen graphics and still incorporate text. This technique lets you create your own style of text characters, or engineering, mathematical, or chemical symbols. To illustrate this capability, we'll provide the code needed for both English and Cyrillic (Russian) alphabets. What could be more

appropriate in this age of *glasnost* than teaching your Apple II to speak Russian?

DEFINING THE CHARACTERS

Although you could use shape tables to define and use graphics characters, there's an easier method. (See "Command Performance," November 1990, p. 70, for details on using shape tables.) Instead of using vectors, you'll define each character by eight numbers that represent the lighted pixels (dots) in each of the eight rows of a character block. You'll then POKE these values into RAM for safe storage before you run your graphics program, then copy the values as needed directly onto the graphics screen. What makes this procedure possible is the fact that the Apple hi-res graphics screens are bit-mapped, meaning that every pixel corresponds to a single bit in RAM.

Starting with a sheet of graph paper, mark off a block with seven vertical columns and eight horizontal rows. Each square represents a pixel on the graphics screen. Each graphics object (character or symbol) must fit within this grid, although you can piece together larger objects by displaying several of these blocks side by side. Number each column at the top of the grid with a column value, starting at the left. These column values are 1, 2, 4, 8, 16, 32, and 64. Draw the desired object by shading squares on the grid. (See **Figure 1**.)

Each of the eight rows will have a value that's determined by the position of the shaded squares in that row. To find the value for a given row, add the column values for each shaded square. In **Figure 1**, for example, the top row has only the third square shaded, so its row value is 4. The fifth row has the first five squares shaded, so its row value is 31 (1 + 2 + 4 + 8 + 16). Continue through your alphabet or symbol list and convert every object you draw into a sequence of eight row values, listing the top-row value first.

In **Listing 1**, the first DATA line has only a single entry that tells your Apple II the number of characters you'll define. The rest of the DATA lines each define a single character. Nine values are listed for each character. The first DATA value determines the RAM location where you'll store that character. The second through ninth values are the eight row values that define the character, as described above.

Although you could store this data in any RAM location that's not in use, I reserve the locations above 36000 by employing a HIMEM:36000 call at the start of the program. Because I'm storing data corresponding to alphabetic and keyboard characters, I list them in their ASCII code order; that way the computer can calculate the starting memory location for each character from its ASCII code. For the English and keyboard characters, the formula is $Location = 36000 + 8 * (ASCII\ value - 32)$. For the Russian characters, the formula is $Location = 36760 + 8 * (ASCII\ value - 64)$.

These formulas make calling up a character easy. You can also write a simple subroutine to have the Apple II calculate a character's location and display the character at a designated spot on screen automatically. (See **Listing 2**.)

By using HIMEM:36000, your Apple II will store all program variables below 36000 — the only concern you have is keeping your program from growing too

large. If you need to, you can make appropriate adjustments in these values to get everything to fit into memory. Just be sure to change the location formulas to match your choice of value for HIMEM.

POKEING DATA INTO RAM

Listing 1 is basically a subroutine (lines 1200–1245) that READs each character's DATA statement, calculates the proper RAM location, and POKEs in the eight row values that follow. For each character, your Apple II reads the memory-location index as M, then uses a loop (FOR J=0 TO 7) to read each of the row values, and POKEs these values into RAM locations calculated as $36000 + M + J$. Because the values for M in each DATA statement increment by eight, no two characters will occupy the same area of RAM. As written, **Listing 1** has 128 total characters. If you want to use only the English and keyboard characters, change line 1300 to DATA 95 and delete lines 1795 to 1955. You can reduce **Listing**

1 further by changing line 1300 to DATA 64 and deleting lines 1625 to 1790 if you don't need lowercase letters.

You could include **Listing 1** in your graphics program as a subroutine, but this would waste a lot of space. Because the character POKEd into RAM will stay there until you turn off the computer, you might prefer to keep **Listing 1** separate and run it before your graphics programs. You can then chain from this program into your first graphics program, making it seem as if there's only one. **Listing 1** connects to a second program at line 40 with a PRINT CHR\$(4); "RUN RUSSIAN ONE" command. Be sure to use RUSSIAN ONE as the file name for **Listing 2** if this feature is to operate as written.

DISPLAYING THE CHARACTERS

Listing 2 demonstrates how to display these graphics characters in the graphics window. (You must run **Listing 1** before executing **Listing 2**, though. And if you've

shortened **Listing 1**, the undefined characters will appear as meaningless smudges on screen when you call them.) When you run **Listing 2**, the computer draws two pictures and labels them in English and Russian. Then it displays two simple Russian sentences along with their English translation and a pronunciation guide (in lowercase) to the Russian words.

First, we must retrieve the bit maps from memory, then we can worry about placing them on the graphics screen. You must assign each word or phrase you want to display in the graphics window to the string variable, Z\$; each object must correspond to a keyboard character. The retrieval subroutine begins with lines 900 and 905 of **Listing 2**; at this location set K, the character-set flag, to either 0 or 1 depending on whether you want English or Russian characters, respectively. We also set the blank flag, B, to 0. If BK=0, and the character you send is "space" (ASCII 32), line 916 will skip the part of the

Listing 1. HI-RES CHARACTERS. This program POKES English upper- and lowercase characters, keyboard symbols, and Russian uppercase characters into RAM, then chains into the program RUSSIAN ONE (Listing 2).

```

1 REM HIRES CHARACTERS
2 REM BY DAN BISHOP
3 REM A+ INCIDER
4 REM *****
5 REM THIS UTILITY POKES CHAR-
6 REM ACTERS & SYMBOLS DEFINED
7 REM IN THE DATA STATEMENTS
8 REM INTO RAM FOR HIRES USE.
9 REM *****
10 HIMEM: 36000
15 HOME
20 VTAB 12
25 PRINT "LOADING CHARACTER DEFINITIONS INTO RAM."
30 GOSUB 1200
35 PRINT : PRINT "FINISHED."
40 PRINT CHR$(4); "RUN RUSSIAN.ONE"
100 END
1200 READ N
1205 FOR I = 1 TO N
1210 VTAB 15: PRINT "WORKING ON CHARACTER "I" OUT OF "N"."
1215 READ M
1220 FOR J = 0 TO 7
1225 READ C
1230 POKE 36000 + M + J, C
1235 NEXT J
1240 NEXT I
1245 RETURN
1300 DATA 128
1305 DATA 0,0,0,0,0,0,0,0: REM BLANK
1310 DATA 8,4,14,14,4,0,4,4,0: REM !
1315 DATA 16,10,10,0,0,0,0,0: REM "
1320 DATA 24,10,10,31,10,31,10,10,0: REM #
1325 DATA 32,4,30,5,14,20,15,4,0: REM $

```

Listing 1. (Continued)

```

1330 DATA 40,3,19,8,4,2,25,24,0: REM %
1335 DATA 48,2,5,5,2,21,9,22,0: REM &
1340 DATA 56,4,4,4,0,0,0,0,0: REM '
1345 DATA 64,4,2,1,1,1,2,4,0: REM (
1350 DATA 72,4,8,16,16,16,8,4,0: REM )
1355 DATA 80,4,21,14,4,14,21,4,0: REM *
1360 DATA 88,0,4,4,31,4,4,0,0: REM +
1365 DATA 96,0,0,0,0,8,8,4,0: REM COMMA
1370 DATA 104,0,0,0,31,0,0,0,0: REM -
1375 DATA 112,0,0,0,0,0,0,4,0: REM PERIOD
1380 DATA 120,0,16,8,4,2,1,0,0: REM /
1385 DATA 128,14,17,17,17,17,14,0: REM 0
1390 DATA 136,4,6,4,4,4,4,14,0: REM 1
1395 DATA 144,14,17,16,16,12,3,31,0: REM 2
1400 DATA 152,15,16,16,12,16,16,15,0: REM 3
1405 DATA 160,12,10,9,9,31,8,8,0: REM 4
1410 DATA 168,31,1,1,15,16,16,15,0: REM 5
1415 DATA 176,30,1,1,15,17,17,14,0: REM 6
1420 DATA 184,31,8,4,2,1,1,1,0: REM 7
1425 DATA 192,14,17,17,14,17,17,14,0: REM 8
1430 DATA 200,14,17,17,30,16,8,7,0: REM 9
1435 DATA 208,0,0,4,0,4,0,0,0: REM :
1440 DATA 216,0,0,4,0,4,4,2,0: REM ;
1445 DATA 224,16,8,4,2,4,8,16,0: REM <
1450 DATA 232,0,0,31,0,31,0,0,0: REM =
1455 DATA 240,2,4,8,16,8,4,2,0: REM >
1460 DATA 248,14,17,8,4,4,0,4,0: REM ?
1465 DATA 256,14,17,21,29,13,1,30,0: REM @
1470 DATA 264,4,10,17,17,31,17,17,0: REM A
1475 DATA 272,15,17,17,15,17,17,15,0: REM B
1480 DATA 280,14,17,1,1,1,17,14,0: REM C
1485 DATA 288,15,17,17,17,17,17,15,0: REM D
1490 DATA 296,31,1,1,7,1,1,31,0: REM E
1495 DATA 304,31,1,1,7,1,1,1,0: REM F

```


Listing 1. (Continued)

```

1500 DATA 312,14,17,1,1,29,17,30,0: REM G
1505 DATA 320,17,17,17,31,17,17,0: REM H
1510 DATA 328,14,4,4,4,4,14,0: REM I
1515 DATA 336,28,8,8,8,8,9,6,0: REM J
1520 DATA 344,17,9,5,3,5,9,17,0: REM K
1525 DATA 352,1,1,1,1,1,31,0: REM L
1530 DATA 360,17,27,21,17,17,17,0: REM M
1535 DATA 368,17,17,19,21,25,17,0: REM N
1540 DATA 376,14,17,17,17,17,14,0: REM O
1545 DATA 384,15,17,17,15,1,1,0: REM P
1550 DATA 392,14,17,17,17,21,9,22,0: REM Q
1555 DATA 400,15,17,17,15,5,9,17,0: REM R
1560 DATA 408,14,17,1,14,16,17,14,0: REM S
1565 DATA 416,31,4,4,4,4,4,0: REM T
1570 DATA 424,17,17,17,17,17,14,0: REM U
1575 DATA 432,17,17,27,10,14,4,4,0: REM V
1580 DATA 440,17,17,17,17,21,27,17,0: REM W
1585 DATA 448,17,27,14,4,14,27,17,0: REM X
1590 DATA 456,17,17,10,4,4,4,0: REM Y
1595 DATA 464,31,16,8,4,2,1,31,0: REM Z
1600 DATA 472,7,1,1,1,1,1,7,0: REM LEFT BRACKET
1605 DATA 480,0,1,2,4,8,16,0,0: REM BACK SLASH
1610 DATA 488,28,16,16,16,16,28,0: REM RIGHT BRACKET
1615 DATA 496,4,10,17,0,0,0,0,0: REM CARROT
1620 DATA 504,0,0,0,0,0,0,0,31: REM UNDERLINE
1625 DATA 520,0,0,14,16,30,17,30,0: REM a
1630 DATA 528,1,1,15,17,17,17,15,0: REM b
1635 DATA 536,0,0,30,1,1,1,30,0: REM c
1640 DATA 544,16,16,30,17,17,17,30,0: REM d
1645 DATA 552,0,0,14,17,31,1,30,0: REM e
1650 DATA 560,12,18,2,15,2,2,2,0: REM f
1655 DATA 568,0,0,14,17,17,30,16,14: REM g
1660 DATA 576,1,1,15,17,17,17,17,0: REM h
1665 DATA 584,4,0,6,4,4,4,14,0: REM i
1670 DATA 592,8,0,12,8,8,8,9,6: REM j
1675 DATA 600,1,1,9,5,3,5,9,0: REM k
1680 DATA 608,6,4,4,4,4,14,0: REM l
1685 DATA 616,0,0,27,21,21,21,17,0: REM m
1690 DATA 624,0,0,15,17,17,17,17,0: REM n
1695 DATA 632,0,0,14,17,17,17,14,0: REM o
1700 DATA 640,0,0,15,17,17,15,1,1: REM p
1705 DATA 648,0,0,30,17,17,30,16,16: REM q
1710 DATA 656,0,0,29,3,1,1,1,0: REM r
1715 DATA 664,0,0,30,1,14,16,15,0: REM s
1720 DATA 672,2,2,15,2,2,18,12,0: REM t
1725 DATA 680,0,0,17,17,17,25,22,0: REM u
1730 DATA 688,0,0,17,17,17,10,4,0: REM v
1735 DATA 696,0,0,17,17,21,21,27,0: REM w
1740 DATA 704,0,0,17,10,4,10,17,0: REM x
1745 DATA 712,0,0,17,17,17,30,16,14: REM y
1750 DATA 720,0,0,31,8,4,2,31,0: REM z
1755 DATA 728,28,6,6,3,6,6,28,0: REM {
1760 DATA 736,4,4,4,4,4,4,4,0: REM |
1765 DATA 744,7,12,12,24,12,12,7,0: REM }
1770 DATA 512,62,65,85,65,85,93,65,62: REM HAPPY FACE
1775 DATA 752,62,65,85,65,65,93,85,62: REM FROWN FACE
1795 DATA 760,30,17,17,30,20,18,17,0: REM YAH
1800 DATA 768,4,10,17,17,31,17,17,0: REM AH
1805 DATA 776,31,1,1,15,17,17,15,0: REM BAY
1810 DATA 784,17,17,17,30,16,16,16,0: REM CHAY
1815 DATA 792,14,10,10,10,10,31,17,0: REM DAY
1820 DATA 800,31,1,1,7,1,1,31,0: REM YAY
1825 DATA 808,4,14,21,21,21,14,4,0: REM EF
1830 DATA 816,31,1,1,1,1,1,1,0: REM GAY
1835 DATA 824,0,17,17,17,23,21,23,0: REM YERRI
1840 DATA 832,17,17,25,21,19,17,17,0: REM EE
1845 DATA 840,73,42,42,28,42,42,73,0: REM ZHAY
1850 DATA 848,17,9,5,3,5,9,17,0: REM KAH
1855 DATA 856,28,20,20,20,20,21,23,0: REM EL
1860 DATA 864,17,27,21,17,17,17,17,0: REM EM

```

Listing 1. (Continued)

```

1865 DATA 872,17,17,17,31,17,17,17,0: REM EN
1870 DATA 880,14,17,17,17,17,14,0: REM OH
1875 DATA 888,31,17,17,17,17,17,0: REM PAY
1880 DATA 896,17,17,21,21,21,63,48: REM SHCHAH
1885 DATA 904,15,17,17,15,1,1,1,0: REM EHR
1890 DATA 912,14,17,1,1,1,17,14,0: REM ES
1895 DATA 920,31,4,4,4,4,4,0: REM TAY
1900 DATA 928,29,21,21,23,21,21,29,0: REM YOU
1905 DATA 936,15,17,17,15,17,17,15,0: REM VAY
1910 DATA 944,17,17,21,21,21,21,31,0: REM SHAH
1915 DATA 952,17,27,14,4,14,27,17,0: REM KHAH
1920 DATA 960,17,17,18,20,12,4,3,0: REM OOH
1925 DATA 968,14,17,16,12,16,17,14,0: REM ZAY
1930 DATA 976,0,1,1,1,15,9,15,0: REM M.ZNAKH
1935 DATA 984,14,17,16,30,16,17,14,0: REM EBOROTNOE
1940 DATA 992,0,3,2,2,14,10,14,0: REM T.ZNAKH
1945 DATA 1000,10,4,17,25,21,19,17,0: REM EKRAKOE
1950 DATA 1008,10,0,31,1,15,1,31,0: REM YOH
1955 DATA 1016,17,17,17,17,17,63,48: REM TSEH

```

Listing 2. RUSSIAN ONE. A beginning Russian-language lesson that illustrates the mixing of English and Russian graphics characters with hi-res graphics.

```

1 REM RUSSIAN ONE
2 REM BY DAN BISHOP, APPLESOFT ADVISOR
3 REM A+ INCIDER, MARCH 1991
4 REM *****
5 REM
10 HIMEM: 36000
15 HGR2 : HCOLOR= 7
20 GOSUB 1200: GOSUB 1100
25 GOSUB 1000: GOSUB 1100
30 TEXT : HOME
99 END
889 REM
890 REM *****
891 REM ROUTINES TO PEEK AND
892 REM POKE CHARACTERS
893 REM FROM RAM. ENGLISH
894 REM CHARACTERS USE K=0 AND
895 REM RUSSIAN CHARACTERS
896 REM USE K=1
897 REM *****
898 REM
900 K = 0: BK = 0: GOTO 910
905 K = 1: BK = 0: GOTO 910
910 FOR R = 1 TO LEN (Z$)
915 Z% = ASC ( MID$ (Z$,R,1))
916 IF Z% = 32 AND BK = 0 GOTO 950
920 KZ = 64: KL = 760: IF Z% < 64 OR K = 0 THEN KZ = 32: KL = 0
925 Z = 8 * (Z% - KZ)
930 FOR RJ = 0 TO 7
935 RV = PEEK (36000 + KL + Z + RJ)
940 POKE L + 1024 * RJ, RV
945 NEXT RJ
950 L = L + 1
955 NEXT R
960 RETURN
990 FOR I = 1 TO 1000: NEXT
995 RETURN
996 REM *****
997 REM 2 RUSSIAN SENTENCES
998 REM *****
1000 Z$ = "I AM WORKING AT THE FACTORY."
1005 L = 16384: GOSUB 900
1010 Z$ = "@ RABOTAU NA ZAVODE."

```

Listing 2. (Continued)

```

1015 L = 16640: GOSUB 905
1020 Z$ = "yah rah.boh.tah.you nah zah.voh.dyeh"
1025 L = 16768: GOSUB 900
1030 H$ = "0,39 TO 279,39"
1040 Z$ = "NO ONE IS AT HOME."
1045 L = 16464: GOSUB 900
1050 Z$ = "NIKTO NE DOMA."
1055 L = 16720: GOSUB 905
1060 Z$ = "neek.toh nee doh.mah"
1065 L = 16848: GOSUB 900
1070 RETURN
1095 REM *****
1096 REM PAUSE/CONTINUE PROMPT
1097 REM *****
1100 Z$ = "PRESS ANY KEY TO CONTINUE.."
1105 L = 17367: GOSUB 900
1110 H$ = "40,183 TO 240,183 TO 240,191 TO 40,191 TO 40,183"
1115 GET A$
1120 Z$ = " "
1125 L = 17360: BK = 1: GOSUB 910
1130 BK = 0
1135 RETURN
1195 REM *****
1196 REM GRAPHICS AND TWO
1197 REM RUSSIAN NOUNS
1198 REM *****
1200 H$ = "25,80 TO 140,80 TO 140,110 TO 25,110 TO 25,80"
1205 H$ = "60,80 TO 60,45 TO 75,45 TO 75,80"
1210 H$ = "90,80 TO 90,55 TO 105,55 TO 105,80"
1215 FOR X = 30 TO 135 STEP 5
1220 FOR Y = 85 TO 105 STEP 5: GOSUB 1290
1225 NEXT Y,X
1230 H$ = "200,93 TO 200,110 TO 240,110 TO 240,93"
1235 H$ = "195,95 TO 220,85 TO 245,95"
1240 H$ = "210,110 TO 210,98 TO 215,98 TO 215,110"
1245 H$ = "220,105 TO 220,98 TO 235,98 TO 235,105 TO 220,105"
1250 Z$ = "FACTORY HOME"
1255 L = 17280: GOSUB 900
1260 Z$ = "ZAVOD DOM"
1265 L = 16424: GOSUB 905
1270 Z$ = "zah.vohd dohm"
1275 L = 16552: GOSUB 900
1285 RETURN
1290 H$ = "X,Y TO X + 2,Y TO X + 2,Y + 2 TO X,Y + 2 TO X,Y"
1299 RETURN

```

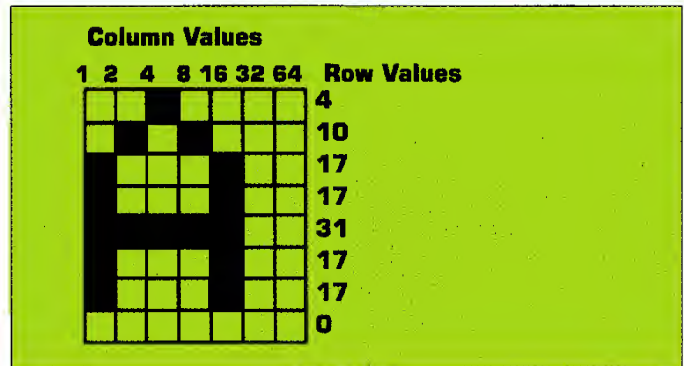


Figure 1. Blocking out objects in a 7-column-by-8-row grid and calculating the eight row values for the defined object.

65	A	A	75	K	K	88	X	X
66	Б	Б	76	Л	Л	96	Ц	Ц
86	В	В	77	М	М	67	Ч	Ч
71	Г	Г	78	Н	Н	87	Ш	Ш
68	Д	Д	79	О	О	81	Щ	Щ
69	Е	Е	80	П	П	95	Ъ	Ъ
95	З	З	82	Р	Р	72	Ы	Ы
74	Ж	Ж	83	С	С	91	Ь	Ь
90	И	И	84	Т	Т	92	Э	Э
73	Й	Й	89	У	У	85	Ю	Ю
94	К	К	70	Ф	Ф	64	Я	Я

Figure 2. The ASCII values for the Russian characters defined in Listing 1 and their keyboard equivalents.

8192	
9216	
10240	
11264	
12288	
13312	
14336	
15360	

Figure 3. Actual RAM addresses for each row value.

subroutine that prints to the screen, increment the screen-location variable, L, and continue to the next character. This feature speeds up displays that have a lot of blanks, and will also prevent blank spaces from erasing any underlying graphics displays. If you want to erase some text during your program, however, you can set BK=1 and your Apple II will print a blank space, erasing whatever was at that location originally.

Lines 910 and 915 calculate the ASCII value of the character in Z\$ that you're printing currently to the screen. Line 920 sets KZ and KL for either the Russian (64

and 760) or English (32 and 0) character set. Line 925 derives the character number from its ASCII code, and lines 930 through 945 read eight successive row values and POKE them into the graphics-screen location designated by L. Because each row of pixels in one character is separated from the next row by 1024, the screen locations are calculated as $(L + 1024 * RJ)$, where RJ cycles from 0 to 7. (See Figure 3.) Line 950 increments L, the screen-location variable, and line 955 sends us back to get another character from Z\$ and do it all over again.

When your computer is finished

displaying one character, L is incremented and the program cycles back to line 910 to pick out the next character in Z\$. You can define as many different sets of characters as you want. Each character must correspond to a keyboard character (upper- or lowercase.) To display that character, you must assign its keyboard symbol to Z\$, give an appropriate value to L for the screen location, and execute a GOSUB to call the display routine.

As with lines 900 and 905, the first line in this subroutine must assign appropriate values to a character-set flag, K, and the blank flag, BK. You must define KZ and

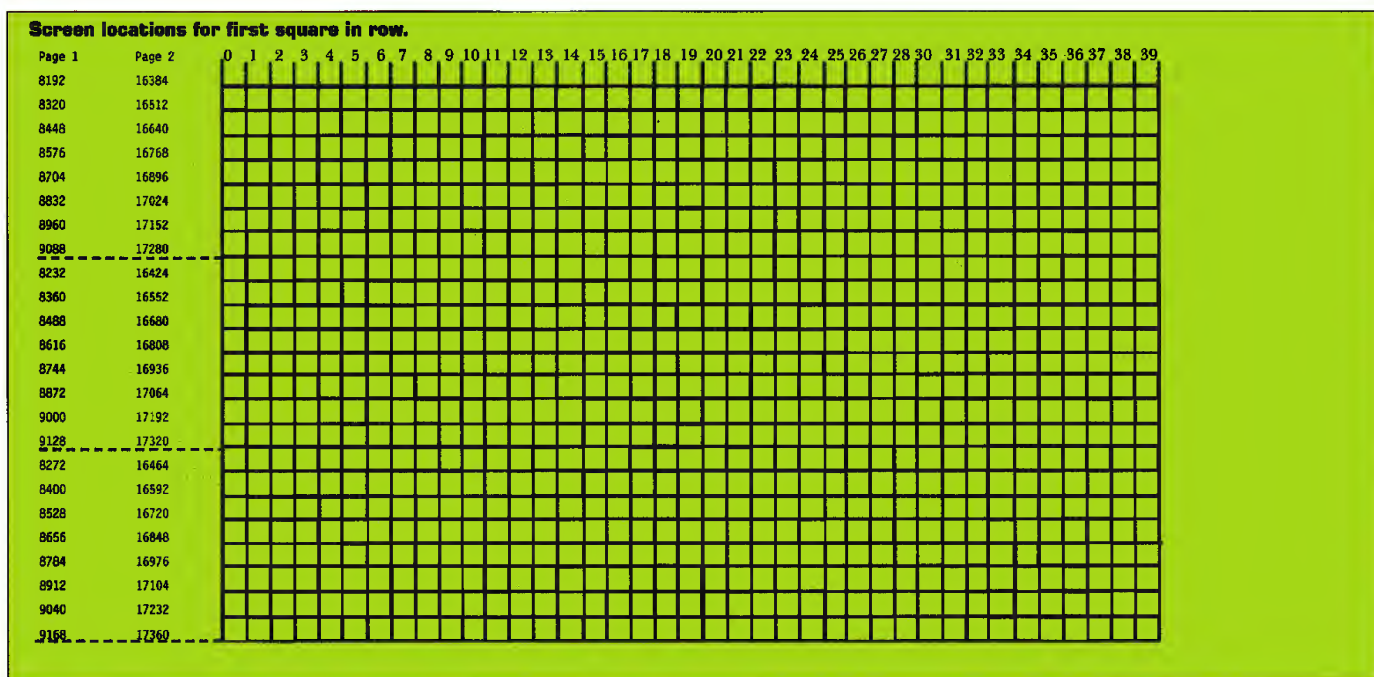


Figure 4. RAM location values in pages 1 and 2 of hi-res graphics to be used for POKEing objects (such as alphabetic characters and symbols) onto the graphics screens. Values shown are the first of 40 successive location values for each of the 24 rows. Each square is seven by eight pixels, as shown in Figure 3.

KL before line 925 in the subroutine (based on the value given to K), so that the program can refer to the correct character set. For example, the first Russian character has ASCII code 65 and is stored at location 36760, so I set KZ to 64 (65 - 64 = 1, the first character) and KL to 760. The rest of the lines in the subroutine stay the same for all character sets. **Figure 2** shows the keyboard equivalent for the Russian character set. I tried to follow phonetic equivalents where possible; thus the Russian symbols H, P, and B are assigned to keys N, R, and V.

The one remaining task you must deal with is calculating L, the on-screen position where you'll place the first character in Z\$. There are 24 rows of 40 blocks each, into which you can display characters. The first row begins at location 8192 and ends at location 8231 in page 1, and begins at location 16384 and ends at location 16423 in page 2. The next seven rows are incremented from these values by 128 bytes per row. So for page 1, the second row uses locations 8320-8359, the third row uses locations 8448-8487, and so on. Rows 9-16 comprise a second section, and are offset from the first section by 40. Row 9 begins at 8232 (8192+40). Row 10 is 128 bytes away from row 9, beginning at 8320.

Finally, rows 17-24 fill another section, and are offset from the first set of values by 80. (**Figure 4** illustrates these anomalies and will help you determine the values you should use for L.)

There are two drawbacks to using this approach for text-character representation that you won't find with shape tables. The first is that the blocks your characters occupy can't be smaller than the seven-by-eight-pixel grid, and they must always be positioned rigidly on screen in the standard 40-column-by-24-row text matrix — you can't overlap them in any way. This requirement doesn't apply to shapes, which can overlap, be any size, and start at any desired pixel location.

The second restriction applies only if you're defining objects larger than the seven-by-eight pixel grid by using two or more adjacent grids, and you want your program to calculate relative locations for the grids automatically. If one grid appears above the second grid, your program must take into account the three-cycle pattern for screen locations shown in **Figure 4**. As long as both grids are displayed within the same cycle, the lower grid's location is simply 128 more than that of the upper grid. If the two grids fall into two different cycles, however, the

calculation to determine the location of the second grid must take this into account.

This column concludes a six-part series on using Applesoft BASIC to program graphics images. We've discussed POKEing symbols into both low-resolution and high-resolution screens and using shape tables in high-resolution graphics. We've also learned to program around the high-resolution graphics windows and to use text-and-graphics mode with the high-resolution page 2 graphics screen. (Several examples of animation were included as well.) Once you begin to feel comfortable using these techniques, your imagination can provide the seeds for some truly remarkable graphics programming. □

EDITORS' NOTE

Dan Bishop is making his last six columns on programming graphics images available in hardcopy and on floppy disk. Send \$19.50 and a 5.25-inch disk (initialized for DOS 3.3 or formatted for ProDOS) to Dan Bishop at the address below. Disks also include copies of the example programs in the series along with Disk Index Selector and Color Code Combo, a Mastermind-type game.

WRITE TO DAN BISHOP AT 4124 BEAVER CREEK DRIVE, FORT COLLINS, CO 80526. ENCLOSE AN SASE IF YOU'D LIKE A PERSONAL REPLY.

Free Product Info

Want to
Know More
About Products Or
Services Advertised
In This Issue?

Here's How.



- ◆ Print your name and address where indicated.
- ◆ Tell us about yourself by answering the questions.
- ◆ Circle the numbers on the card corresponding to the reader service number for products or services that interest you.

- ◆ Tear out and mail the card – the postage is on us.
- ◆ Subscribe to *inCider/A+* by checking off the ☐ where indicated. We'll bill you \$27.97 for 12 issues of *inCider/A+*. *
That's 40% off the cover price. Look for your subscription in 6-8 weeks.

NO OBLIGATION. Literature on products and services will be sent to you directly from advertisers, free of charge.

* This rate is limited to the U.S.

DIRECT TO YOU AT NO COST OR OBLIGATION

inCider

A+
Apple II/Macintosh

Reader Service Card

August Issue
Valid until
October 15, 1991

Name _____
Title _____
Address _____
City _____ State _____ Zip _____
Phone () _____



Check here to start your subscription to *inCider/A+*.
You will be billed \$27.97 for 1 year (12 issues). *

I What computer do you use and/or plan to buy in the next 3 months?

	Use	Plan to buy
Apple II	1	4
Macintosh	2	5
IBM/MS-DOS	3	6

Which model?

Apple IIgs	a	i
Apple IIe/c/c Plus	b	j
Mac SE/Mac Plus	c	k
Mac Classic	d	l
Mac LC	e	m
Mac SE/30	f	n
Mac II series	g	o
Other computer	h	p

II Are you an educator? Yes ☐ q

1	26	51	76	101	126	151	176	201	226	251	276	301	326	351
2	27	52	77	102	127	152	177	202	227	252	277	302	327	352
3	28	53	78	103	128	153	178	203	228	253	278	303	328	353
4	29	54	79	104	129	154	179	204	229	254	279	304	329	354
5	30	55	80	105	130	155	180	205	230	255	280	305	330	355
6	31	56	81	106	131	156	181	206	231	256	281	306	331	356
7	32	57	82	107	132	157	182	207	232	257	282	307	332	357
8	33	58	83	108	133	158	183	208	233	258	283	308	333	358
9	34	59	84	109	134	159	184	209	234	259	284	309	334	359
10	35	60	85	110	135	160	185	210	235	260	285	310	335	360
11	36	61	86	111	136	161	186	211	236	261	286	311	336	361
12	37	62	87	112	137	162	187	212	237	262	287	312	337	362
13	38	63	88	113	138	163	188	213	238	263	288	313	338	363
14	39	64	89	114	139	164	189	214	239	264	289	314	339	364
15	40	65	90	115	140	165	190	215	240	265	290	315	340	365
16	41	66	91	116	141	166	191	216	241	266	291	316	341	366
17	42	67	92	117	142	167	192	217	242	267	292	317	342	367
18	43	68	93	118	143	168	193	218	243	268	293	318	343	368
19	44	69	94	119	144	169	194	219	244	269	294	319	344	369
20	45	70	95	120	145	170	195	220	245	270	295	320	345	370
21	46	71	96	121	146	171	196	221	246	271	296	321	346	371
22	47	72	97	122	147	172	197	222	247	272	297	322	347	372
23	48	73	98	123	148	173	198	223	248	273	298	323	348	373
24	49	74	99	124	149	174	199	224	249	274	299	324	349	374
25	50	75	100	125	150	175	200	225	250	275	300	325	350	375

inCider

A+
Apple II/Macintosh

Reader Service Card

August Issue
Valid until
October 15, 1991

Name _____
Title _____
Address _____
City _____ State _____ Zip _____
Phone () _____



Check here to start your subscription to *inCider/A+*.
You will be billed \$27.97 for 1 year (12 issues). *

I What computer do you use and/or plan to buy in the next 3 months?

	Use	Plan to buy
Apple II	1	4
Macintosh	2	5
IBM/MS-DOS	3	6

Which model?

Apple IIgs	a	i
Apple IIe/c/c Plus	b	j
Mac SE/Mac Plus	c	k
Mac Classic	d	l
Mac LC	e	m
Mac SE/30	f	n
Mac II series	g	o
Other computer	h	p

II Are you an educator? Yes ☐ q

1	26	51	76	101	126	151	176	201	226	251	276	301	326	351
2	27	52	77	102	127	152	177	202	227	252	277	302	327	352
3	28	53	78	103	128	153	178	203	228	253	278	303	328	353
4	29	54	79	104	129	154	179	204	229	254	279	304	329	354
5	30	55	80	105	130	155	180	205	230	255	280	305	330	355
6	31	56	81	106	131	156	181	206	231	256	281	306	331	356
7	32	57	82	107	132	157	182	207	232	257	282	307	332	357
8	33	58	83	108	133	158	183	208	233	258	283	308	333	358
9	34	59	84	109	134	159	184	209	234	259	284	309	334	359
10	35	60	85	110	135	160	185	210	235	260	285	310	335	360
11	36	61	86	111	136	161	186	211	236	261	286	311	336	361
12	37	62	87	112	137	162	187	212	237	262	287	312	337	362
13	38	63	88	113	138	163	188	213	238	263	288	313	338	363
14	39	64	89	114	139	164	189	214	239	264	289	314	339	364
15	40	65	90	115	140	165	190	215	240	265	290	315	340	365
16	41	66	91	116	141	166	191	216	241	266	291	316	341	366
17	42	67	92	117	142	167	192	217	242	267	292	317	342	367
18	43	68	93	118	143	168	193	218	243	268	293	318	343	368
19	44	69	94	119	144	169	194	219	244	269	294	319	344	369
20	45	70	95	120	145	170	195	220	245	270	295	320	345	370
21	46	71	96	121	146	171	196	221	246	271	296	321	346	371
22	47	72	97	122	147	172	197	222	247	272	297	322	347	372
23	48	73	98	123	148	173	198	223	248	273	298	323	348	373
24	49	74	99	124	149	174	199	224	249	274	299	324	349	374
25	50	75	100	125	150	175	200	225	250	275	300	325	350	375

Free Product Info

**DIRECT TO YOU
AT NO COST OR OBLIGATION**



BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 1217 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED
STATES



inCider/A+

ATTN: Reader Service Dept.

P.O. Box 8987

Boulder, CO 80328-8987



BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 1217 BOULDER, CO

POSTAGE WILL BE PAID BY ADDRESSEE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED
STATES



inCider/A+

ATTN: Reader Service Dept.

P.O. Box 8987

Boulder, CO 80328-8987



**Want to
Know More
About Products Or
Services Advertised
In This Issue?**

Here's How.



- ◆ Print your name and address where indicated.
- ◆ Tell us about yourself by answering the questions.
- ◆ Circle the numbers on the card corresponding to the reader service number for products or services that interest you.
- ◆ Tear out and mail the card – the postage is on us.
- ◆ Subscribe to *inCider/A+* by checking off the where indicated. We'll bill you \$27.97 for 12 issues of *inCider/A+*. **That's 40% off the cover price.** Look for your subscription in 6-8 weeks.

NO OBLIGATION. Literature on products and services will be sent to you directly from advertisers, free of charge.

READER SERVICE INDEX

Reader Service

Page

103 Alltech Electronics Co. Inc.	73
* Applied Engineering	CV4, 22, 23
87 Bible Research Systems	76
115 Chinook Tech.	74
21 Co-Du-Co	76
14 Complete Technology	68
288 Computer Friends	66
134 Dayton Computer Supply	76
220 Educational Resources	9
94 FantasyWorks Software	76
85 Fas-Track Computer Prods	59
24 Frog Systems	77
* inCider/A+	77
Publish It Yourself	77
Special Products	17
44 LRO Computer Sales	65
248 Memory Plus Distribution	27
13 Microgram Systems	75
55 National AW User Group	75
71 Nite Owl Productions	76
16 OEM Corporation	77
35 PC Globe	69
59 Perfect Solutions	75
* Preferred Computing	18, 19
105 Price Busters	11
128 Programs Plus	28, 29
136 Quality Computers	2, 3, 4, 5, 53, 54, 55
7 Ramco Computer Supplies	77
33 Remarkable Products	21
90 Roger Coats	6
29 Shreve Systems	75
291 Softdisk	1
127 SoftSpoken, Inc.	76
23 Software of the Month Club	77
18 Sports Software Assoc.	77
60/3 Spring Branch Software, Inc.	76
36 Sun Remarketing	77
6 The AppleWorks Educator	75
56 TMS Peripherals, inc.	CV3
231 Tulin Corp.	71
297 USA Micro	67
290 Vizi Flex Seels	77
17 VMC Marketing	77
189 Zip Technology	CV2
26 Zuhyde	75

This index is provided as an additional service. The publisher does not assume liability for errors or omissions.

WE TERMINATE BAD DEALS!

Dedication to the Apple II and You Unbeatable Prices
Great Service Great Products & Support for Them!

RAM Memory

All our memory & expansion kits are guaranteed with a 5 years "No Questions Asked" replacement warranty. We use only the fastest available chips to guarantee compatibility with all your Apple IIs, Lasers and Macs.

1 MEG SIMMs (1max8)	\$ 49.00
256K SIMMs (1max8)	\$ 14.00
1 MEG 80ns Exp Set(1max8)	\$ 51.00
256K 100ns Exp Set (256kx8)	\$ 18.00
NEW! For GS RAM III	
1 meg x 4 Exp Set	\$ 49.00

Expansion Cards

CV-Tech RAMBoard..... 1 MB..... \$ 145.00
Use your existing RAMBoard by simply snapping it on the CV card.
Call for compatibility details.

	4 MB	2 MB	1 MB
GS-4 card	\$239	\$144	\$ 94.00
Chinook RAM4000	\$275	\$185	\$139.00
GS Sauce card	\$269	\$175	\$129.00
OCTORam	\$299	\$199	\$149.00
GS RAM Plus	\$339	\$239	\$190.00
GS RAM III	\$295	\$199	\$149.00
RAMWorks III	\$184	\$149	\$129.00
Z-RAM Ultra II	\$239	\$208	\$189.00
AE 3.5 Drive	\$184	\$239.00	

9MHz/16K ZIP 1800
\$219.00
Now Faster Than Ever!

Call For Free Catalog!

TransWarp GS 8K Cache \$ 219.
TransWarp GS 32K Cache \$ 294.

TransWarp 32K Cache Upgrade \$ 85.
TransWarp Speed Upgrade 9MHz \$ 109.

HyperStudio GS w/digitizer \$ 82.
HyperCard GS \$ 79.
Enhanced VisionPlus \$ 279.

Entertainment Software

We Have The Best & The Newest From
FTA & other Great Artists...

Transylvania III (GS)	\$ 19.00
Photonix II (GS) FTA/France	\$ 40.00
Bouncing Bluster II (GS) FTA/France	\$ 53.00
The GATE (GS) FTA/France	\$ 45.00
Space Shark (GS) FTA/France	\$ 45.00
Space Fox (GS) FTA/France	\$ 45.00
Tunnels of Armageddon (GS)	\$ 26.00

GS POWER SYSTEM

This powersystem includes:
ROM 3 CPU, AE 3.5" HDDrive,
40 MB NC Pro, Magnavox RGB,
TransWarp GS, RAMFast v2.0,
Box of 10 disks, Mousepad

LRO PowerPrice:

\$1,859

VISA/MC/DISCOVER
ACCEPTED!

©1991 OCP Marketing Group/Colour Concepts

No surcharge for Visa/MC. Add \$5 for FedEx COD Service. Add \$4 for UPS COD Service. Illinois residents add 6.5% sales tax. No sales tax for out of state purchases. All Hardware may be returned within 30 days of receipt with no restocking fee (Must have RMA#). Shipping charges vary. Prices & availability subject to change. School POs and CODs Welcome So There!

QuickAccess Drives

The QuickAccess series by LRO Computer Sales offers you the performance and quality of drives costing nearly twice as much. Our 52, 120 & 200 exclusively use only proven Connor VCA mechanisms while our 135 and 185 drives use high quality Fujitsu VCA mechanisms. Find the perfect drive that suits your needs best. Includes latest system software and all cables. Over 20 megabytes of the best GS software including Backup, Restore & Program Launching utilities. All drives covered by a 2 year warranty.

QuickAccess 52 (Quantum LPS)	\$ 369.00
QuickAccess 105 (Quantum LPS)	\$ 549.00
QuickAccess 120 (Conner)	\$ 579.00
QuickAccess 135 (Fujitsu)	\$ 619.00
QuickAccess 185 (Fujitsu)	\$ 799.00
QuickAccess 200 (Conner)	\$ 879.00

NCS PRO Drives

New from New Concepts! The SlimLine NCS PRO Drives! Small, Fast, Reliable and AFFORDABLE. Using Conner and Quantum mechanisms these drives are powered by your floppy port with the same form and size factor of the Apple 3.5" drive. Dual SCSI, power ports and push button SCSI selector. Includes all cables. Requires SCSI card for use on the Apple II (such as the Apple SCSI or RAMFast by CV-Tech.)

NCS PRO 40	\$ 369.00
NCS PRO 100 LPS	\$ 569.00
NCS PRO 120	\$ 589.00

SCSI Cards

Get The Right SCSI card for Your System! The RAMFast DMA SCSI from CV-Technologies is the fastest SCSI interface for your Apple II - Now even better with v2.0 hardware. The Apple DMA SCSI is proven, fast and reliable.

RAMFast SCSI v2.0	\$ 189.00	with drive \$ 179.00
RAMFast Upgrade to V2.0	\$ 14.00	
Apple SCSI	\$ 109.00	\$ 99.00

Applied Engineering

Vulcan 20	\$ 495.00
Vulcan 40	\$ 87.

GS-Numerics	\$142.
Mac Numerics	

Hard Drives for IIC

Chinook 40c	\$ 579.00
Chinook 80c	\$ 699.00

Macintosh Hardware

Turbo CL-The
Macintosh Classic Accelerator
from Harris Labs! Increase your performance by 95%. Math co-processor option available (500+%)
Turbo CL Accelerator.....\$249.00

Publish It! Easy II (Mac) \$149
Publish It! 4 (Apple IIe/cgs) \$ 94

We Carry All AE Macintosh Products!
CALL for Best Prices Nationwide!

We Will be at **KansasFest!**
Meet Dave from AE and his loaded GS with the latest and greatest that AE has to offer!

We Ship Overnight!
Saturday Delivery!

FAX (815) 338-4332
Tech Support (815) 338-8913
Inquiries (815) 338-8746
CALL NOW • TOLL FREE

**LRO
COMPUTER
SALES**

(800) 869-9152

Illinois Residents Call (815) 338-8685

REVIEWS

Continued from p. 31

contestants must meet the challenges of all nine layouts to win.

Each game of Tesseract is actually a puzzle. Play begins on a board filled completely with tiles. Challengers try to solve the puzzle by clearing the pieces in as few moves as possible. Only one tile should remain by game's end.

Tesseract is easy to play, but difficult to win. The game features three types of tiles: *primary* (yellow, blue, or red), *secondary* (green, gold, or pink) and *tertiary* (gray). On black-and-white screens, it's simple to distinguish one tile from the next by the geometric pattern on its face. *Primary* tiles display a cross, square, or circle. Secondary tiles, which combine two primary tiles, have a cross in a square, a cross in a circle, or a circle in a square. A tertiary tile incorporates all three primary tile patterns. The software generates a random assortment of tiles according to the difficulty level you've selected. Beginner-level mosaics

typically have one secondary tile for every three primary tiles. Intermediate-level game boards include one secondary tile for each primary tile. Advanced games feature three secondary tiles for every five primary tiles, with a few tertiary tiles thrown in just to spice up the action.

Players clear the board by jumping tiles. Unlike checkers, Tesseract tiles can jump horizontally, vertically, or diagonally. When a primary tile jumps another primary tile and lands on an empty square, it leaves two empty spaces behind. But, because secondary and tertiary tiles are "combinations," they require more than one jump to remove. Jumping a tertiary tile produces a secondary, and jumping a secondary produces a primary. You can also create higher-level tiles by landing one tile on top of another. If all this sounds confusing, don't panic. Position the cursor over a tile and you can tell if it's movable. Although you must decide the best of all possible moves, Tesseract offers clues. If a tile is movable,

the cursor changes from a hand-shaped to a cross-shaped pointer. When you click on a movable tile, Tesseract points out the squares to which you can move the tile legally.

In addition to hints on moving, Tesseract features 26 screens of detailed on-line instructions, complete with demonstrations. You can read the instructions in sequence, or proceed directly to a particular topic by selecting it from the *Table of Contents*. The documentation is well written and easy to follow, and you can access it before or during game play.

BUILT FOR COMFORT

The author provides several nifty options to increase Tesseract's "playability." You can face challenges with or without music and sound effects; decide whether or not to listen to the sound of tiles clicking as you move the mosaics from the board; and determine the speed at which the tiles flip (fast, slow, or no flip) during play. These effects give the game 3-D appeal.

Also, a special option directs the program to shift into "boss alert" (screen-saver) mode. Pressing Command-H initiates the screen saver, effectively hiding game play from view. When the coast is clear, press any key on the keyboard to resume play exactly where you left off. Save the current game and open it later at a more convenient time.

Tesseract is so appealing that you'll play for hours without becoming bored. The puzzles pit mind against matter, brain against board, and intellect against tile. This electronic amusement shares much in common with other popular strategy games, such as Spectrum HoloBytes' Tetris, Faces, and Welltris — there's more to winning than simply "boom and doom."

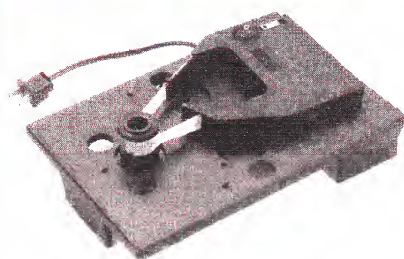
Yet, unlike the games from Spectrum HoloByte, Tesseract plays without a clock. You can take all the time you need to solve the puzzles, undoing as many moves as necessary to come up with the most elegant solution. Solve a puzzle and you're rewarded with an amusing display of animated tiles and electronic pyrotechnics. If you're looking for a great way to relax after a hard day's work, Tesseract may be the perfect escape (next to ice cream). It not only sharpens the mind, it's also low in calories!

Carol S. Holzberg, Ph.D.
Shutesbury, MA

Never buy another ribbon!

MacInker

Over 175,000 sold since 1982



Free bottle of ink, reservoir cover, ink meter, and dispenser.

\$45.00

MacInker™, the automatic ribbon re-inker. The Imagewriter MacInker (mod 234im) re-inks Imagewr. I/II black & single color cartridges. The Universal MacInker also re-inks hundreds of different cartridge types (including the Imagewriter LQ) with suitable adaptors. Extra dark, dot matrix, lubricated ink yields a truly better than new print quality and extends print-head life. Average number of re-inkings/cartridge is 60-100. With the Multicolor Adaptor (mod M422, \$40.00) your MacInker can re-ink the multicolor Imagewriter II cartridges. We have a full range of optional accessories, inks & cartridges: indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. Free catalog.

Imagewriter I/II MacInker (mod 234im).....	45.00	Extra ink bottle	3.00
Multicolor Adaptor (mod M422).....	40.00	Pint	18.50
Epson MacInker (mod 271ep).....	42.00	Imagewr. I/II cartridges.....	3.15/ea
Universal MacInker (specify printer)	75.00	4-color cartridges	10.00/ea
Heat Transfer Adaptor	25.00	Heat Transfer cartridges	call

Apple Autoswitch - Data Switches - Modems

4 port 8 pin	50.00	Apple Autoswitch (4 to 1)	145.00
4 port 9 pin	50.00	cables any type.....	call



Best Buy among 2400 baud modems (MacUser, Dec. 90), MNP class 5 error correction, 2 yr warranty, 100% Hayes comp. LightSpeed 2400LE159.00



All the power of a high quality 2400 b modem in your pocket. AC & battery. 100% Hayes compatible. Micromodem 2400 ..149.00

Order Toll Free (800)547-3303

Satisfaction or 30 day money back on all products. Major credit cards accepted. Shipping \$5.50 on most products

Computer Friends, Inc.,
14250 NW Science Park Dr. Portland OR 97229
tel. (503)626-2291 - fax (503)643-5379

CHILDREN'S NEWSPAPER MAKER

ORANGE CHERRY SOFTWARE
Box 390, WESTCHESTER AVE., POUND RIDGE, NY
10576, (800) 672-6002, or (914) 764-4104
Kids' DTP program; 1-megabyte Apple IIGs; \$59



If your elementary or middle-school writing class has been sluggish lately, Orange Cherry Software may have just the elixir — Children's Newspaper Maker. Despite its quirks, this desktop-publishing program for kids aged 8 to 12 can entertain youngsters while it helps them overcome writer's block.

Children's Newspaper Maker offers three levels of interaction for student penmen. In Level 1 children prepare the 11 parts of an imaginary newspaper by clicking on each of the newspaper sections — *Newspaper Title, Your Name, The Date, Weather, Earth and Health News, World News, School News, Sports, Movie Reviews, Funny Lifestyles, and Travel Notes* — and selecting the items they want to include. In *Newspaper Title*, for example, kids can choose one of four beautiful banners.

Although the first level doesn't let students write or edit news articles, it's an entertaining, interactive tutorial that familiarizes children with the mouse, and teaches them newspaper anatomy by example — not by lecture.

Each finished publication — a two-page, two-column newspaper — looks good, particularly when it's printed in full color on an ImageWriter II. Given the many possible choices in each newspaper section, every child in your class can prepare his or her own unique, personalized tabloid.

Levels 2 and 3 build on Level 1's newspaper construction-set approach. They offer progressive degrees of freedom and challenge, by encouraging kids to edit stories and compose their own eventually. Students load story-starter *News Sheets*, then edit or finish them with their own words. Ready-made *News Sheets* cover topics such as community news, conservation, feature stories, leisure news, school news, science, weather, and world events. Using canned news is as easy as pulling down the *File* menu, selecting *Load Sheet*,

and choosing the desired topic from the standard file directory that appears on screen. Double-click the name of the file or click on the file and the *Open* button.

It takes a little practice to become proficient in manipulating text frames, or "blocks" as the program calls them. When you click on a story in a canned news sheet, a flashing border appears. Conventional desktop-publishing programs offer tools such as the I-beam for editing text.

Probably for simplicity's sake, Children's Newspaper Maker doesn't; instead it requires a child to choose *Edit Text* from the menu. Only rudimentary word-processing features are available. There are no spell-checker or text-justification options, and you can't select text for removal by dragging with the mouse and invoking a *Cut* command. Nor are there any alternate keyboard commands for speeding up your work. ◇

The Sensational Lasers Apple IIe/IIC Compatible \$289



The Laser 128™ features full Apple™ II compatibility with an internal disk drive, serial, parallel, modem, and mouse ports. When you're ready to expand your system, there's an external drive port and expansion slot. The Laser 128 includes COPY II PLUS software! Take advantage of this exceptional value today! \$289

Super High Speed Option! only \$365

The LASER 128EX has all the features of the LASER 128, plus a triple speed processor and memory expansion to 1MB \$365.00

LASER PC-4 the Notebook Computer that has received rave reviews. Transfer software included w/Serial and parallel cables.

MAC Version **New!** \$229.00
IBM Version **New!** \$209.00

DISK DRIVES

* 5.25 LASER/Apple IIc \$ 99.00
* 5.25 Apple IIe \$ 99.00
* 3.50 Apple 800K \$139.00
* 5.25 LASER Daisy Chain \$109.00
* 3.50 LASER Daisy Chain \$179.00

Save Money by Buying a Complete Package!

THE STAR LASER 128 Computer with 12" Monochrome Monitor and the LASER 192E Printer \$565.00

THE SUPERSTAR LASER 128 Computer with 14" RGB Color Monitor and the LASER 192E Printer \$675.00

ACCESSORIES

* 12" Monochrome Monitor \$109.00
* 14" RGB Color Monitor \$229.00
* LASER 192E Printer - Epson **New!** \$199.00
* LASER 192A Printer - Apple **New!** \$219.00
* LASER 2424 Printer - 24Pin **New!** \$299.00
* LASER 128 RAM Card OK \$ 29.00
* Mouse \$ 49.00
* Joystick (3) Button \$ 29.00
* UDC Card \$ 49.00

USA MICRO

**YOUR DIRECT SOURCE FOR APPLE
AND IBM COMPATIBLE COMPUTERS**

2888 Bluff Street, Suite 257 • Boulder, CO. 80301
Add 3% Shipping • Colorado Residents Add 3% Tax

Your satisfaction is our guarantee!

Phone Orders: 1-800-654-5426

8-5 Mountain Time • No Surcharge on Visa or MasterCard Orders
Customer Service 1-800-537-8596 • In Colorado (303) 938-9089
FAX Orders: 1-303-939-9839

Laser 128 is a registered trademark of Video Technology Computers, Inc. Apple, Apple IIe, Apple IIc and ImageWriter are registered trademarks of Apple Computer, Inc.

Circle 297 on Reader Service Card.

COMPLETE TECHNOLOGY Announces COMPLETE Pascal Version 2.0

Now Upgraded!
Formerly TML Pascal II

FEATURES:

- Integrated Editor, Compiler, Linker, and Resource Editor.
- Improved Resource Editor
 - Icon Editor, Create and Import Icon Resources.
 - Cursor Editor, Create and Import Cursor Resources.
 - New String Editor allows editing of formatting codes.
 - New Alert String Editor supports all window sizes.
 - Supports Picture controls.
 - Include Custom Controls you develop yourself.
 - Allows you to import Code Resources.
- Up to date Interfaces For All 5.0.X Toolbox routines.
- Use ASM and C Subroutines By Calling Code Resources.
- ANSI standard Textbook Pascal operation for easy classroom use.

COMPLETE Pascal now fully supports virtually all resource types defined by Apple Computer, Inc. Our new editor allows you to complete the design of your desktop program in record time and move on to the important part, writing the code. Our compiler allows you to compile that code at a speed of over 6000 lines a minute. The lightening fast linker then takes over to complete the process of creating an executable Apple IIGS application.

Assembly language and C subroutines are available to you when using COMPLETE Pascal by taking advantage of Code Resources. We have included a routine in our libraries that will call the code resource via a pointer to its location in memory.

Our feature packed integrated editing, compiling, and linking environment is easy enough to use for students and beginners as well as powerful enough for the most advanced programmer.

Order Now!
COMPLETE Pascal
Only \$125.00

COMPLETE TECHNOLOGY
2443 S. Colorado Blvd. #221
Denver, Colorado 80222
303/758-0920
Visa & MasterCard Accepted
School P.O.'s Welcome

Circle 14 on Reader Service Card.

REVIEWS

Both Levels 2 and 3 feature some authentic GS features such as pull-down menus (*Apple, File, Edit, Fonts, and Special*) and dialog boxes — but no scroll bars. The full width of each newspaper page appears on screen; press the up- and down-arrow keys to scroll vertically. The program's 15-page manual doesn't seem to document this feature; I discovered this detail, as well as a few other Children's Newspaper Maker fine points, by sheer dumb luck. Taking all this into consideration, the program's manual commits too many sins of omission for it to receive a passing grade.

STOP THE PRESSES

You can save finished news sheets with unique names on data disks formatted with Children's Newspaper Maker. During one Level 2 work session, however, the *Format a Disk* option remained dimmed. When I switched to Level 3 the option was activated.

The design of the disk-formatting dialog box isn't standard, but you'll be able to live with that. What you won't be able to live with is a disk formatter that doesn't warn you when you're about to initialize a disk that contains data. The software's unacceptable error-handling features, including the program's failure to warn you about saving a news sheet before beginning another one, also receive a failing grade.

When your students begin to perform more than just minor editing of canned news sheets, they're probably ready to work with Level 3. Offering virtually identical features, Level 2 and Level 3 are different more in concept than in reality. At either level you can load canned news sheets or create new ones from scratch.

Choose the *New Sheet* option (*File* menu) and draw new text and graphics frames. Placing a new frame is a snap: Just click on the page location where you want the object to appear. Use selection handles to position and enlarge each frame.

Be warned: Reckless clicking creates frames that when empty or unselected are

invisible and hinder the page-design process. For example, if you'd like to enlarge a text frame, other frames that get in the way can prevent you from doing so. Any invisible, impeding frame flashes briefly, however. Click on it (tricky some-

times because it "disappears" from view), pull down the *Edit* menu, and choose *Remove Item*. In general, page layout can be a klutzy proposition because Children's Newspaper Maker doesn't let you drag frames over other frames — so plan ahead.

If you'd like to import an illustration, simply create a graphics frame, pull down the *Edit* menu, and select *Load Graphic*. The program disk provides dozens of good-looking black-and-white clip-art graphics. You may have to nudge or resize other frames temporarily to place the illustration.

The manual announces in cavalier fashion that you can import graphics images created with other programs — but it doesn't specify the format. I imported super-hi-res graphics from PaintWorks Gold and GraphicWriter III, but I was unable to use AppleWorks GS images or double-hi-res graphics from Publish It! 4.

Whatever the native state of the art, Children's Newspaper Maker strips it of color. News sheets created with Level 2 and Level 3 are black-and-white-only, one-page documents. You have to collate or cut and paste printouts manually to create a full-fledged newspaper.

Like many Orange Cherry products, Children's Newspaper Maker is long on concept and short on actual performance. Incomplete documentation, poor error-handling, and bare-bones word-processing and page-layout capabilities cripple this program seriously. I relish the program's three-level approach to enticing kids to write, and hope that Orange Cherry Software will devote additional time to the unglamorous but crucial finishing touches that make a product a winner.

Cynthia E. Field, Ph.D.
Wakefield, RI



Create your own news sections.

SUPER GS AWARD MAKER

ORANGE CHERRY SOFTWARE
Box 390, WESTCHESTER AVE., POUND RIDGE, NY
10576, (800) 672-6002, or (914) 764-4104
Award-design program; 768K Apple IIGs; \$49.95



Super GS Award Maker is a software paradox. This program, which purportedly offers more than five dozen ready-made award designs, couldn't win an award itself. Although the inspiration behind the program is good, its execution keeps it at the bottom of the barrel.

Even the term "award" seems a little facetious. At least one-fifth of its documents aren't awards at all. Take the *Merry Christmas* and *Celebrate Flag Day* mini-posters in the *Holidays* folder, for example. Of the 12 more-or-less academic award topics, *Holidays* offers the largest number of choices with 14 designs in all. But ironically, they're not awards and you can't customize them.

Strip away the hyperbole and Super GS Award Maker is essentially a series of Apple Preferred Format paintings to which you can sometimes add the recipient's name and the recognition date. To its credit, the program offers sufficient room to type, even the longest name, but the name probably won't be centered on the line. Forget the usual font choices GS users enjoy — they're not available here. With Super GS Award Maker what you see is what you get — and what you get isn't much. For example, I discovered by trial and error



An award for any occasion.

that you must type dates in the format 8/3/91. You can't spell out the name of the month, and the program doesn't convert the 8 to August, either. Even some 8-bit programs do that automatically.

The program offers only a single blank award template — a glorified border on which you can type the recipient's name, the date, and one line of text for the award

title. All text — what little there is of it — is centered vertically and horizontally automatically. The overall effect is pretty stark. To make matters worse, the blank award's border is out of whack. At first look the obvious skewing of the top and bottom sections seems intentional, but measuring the left and right sides proves that they're simply "off."

Printing documents presents more disappointments. After producing a representative sample of awards on an ImageWriter II with a fresh color ribbon (you can also print in black-and-white), almost all yellow sections came out striped with red.

Super GS Award Maker isn't just impoverished in features and hampered in overall performance: Its error-handling abilities are the worst. For example, you can't access the *Quit* option (listed under the *File* menu) from the main-menu award screen. If you press the escape key to try to "back out," you see a directory with some indecipherable text. You may be able to recover, though, by clicking on the *Cancel* button. Once you've chosen an award and selected the *Enter Text* feature, you can't change your mind. You have to enter some keystrokes — even create a bogus award — before you can escape. Stopping the printer once it's begun is a challenge, too. Pressing the standard GS command Open apple-Period crashes the program. You'll wonder if the "Stupid System Error" message is your GS trying to tell you something.

Super GS Award Maker digresses too liberally from Apple's "Human Interface." While the menu bar looks standard, don't expect to find any quick-key alternate commands listed. Double-clicking on the desired award in the pop-up directory gets you nowhere fast: You have to click on the award's name, then on the rectangular *Load* button. And you couldn't save awards even if you wanted to. In fact, if you happen to pull down the *File* menu and choose *Enter Text*, you'll erase entries you typed previously. You probably don't want to create a series of awards for a whole class or extracurricular club this way.

The program's Flag Day "award" betrays a lot about the software's general lack of attention to detail. Seven stripes and 44 stars? You'd be better off buying yourself a ruler and a good set of markers instead. □

Cynthia E. Field, Ph.D.
Wakefield, RI

TO YOU IT'S
GEOGRAPHY. TO THEM,
IT'S A TOTALLY "RAD"
ALTERNATIVE.

Getting kids to learn about the world is no simple task. The future is what happens a moment from now. Geography is what lies between home and school. The world seems relatively small.

APPLE® II SERIES SOFTWARE, TO COVER MORE GROUND.

Introducing easy-to-use geography programs that help stimulate learning, while still entertaining.



GEOPUZZLE USA, \$39.95.

Questions, puzzles and data make the entire country and its history as familiar as your own backyard.

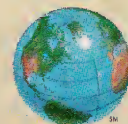
GEOQUIZ, \$49.95.

An absorbing game, dynamic educational tool and global travelogue all in one. For the Apple® IIGs only.

DESKTOP GEOGRAPHY FOR AN EVER-CHANGING WORLD.

Simple-to-use products for global understanding. Because knowing what's where is just as important as knowing what's what.

AT YOUR LOCAL RETAILER,
OR CALL 1-800-255-2789.



PC Globe, Inc.

4700 South McClintock Drive, Tempe, Arizona 85282
(602) 730-9000 Facsimile (602) 968-7196

SOFTWARE FOR EVERYWHERE.™

© 1991 PC Globe, Inc. All rights reserved. "Geopuzzle USA" and "GeoQuiz" are trademarks of PC Globe, Inc. PC Globe, Inc. software patent pending.

Circle 35 on Reader Service Card.

August 1991 • inCider/A+ • 69



WORDS TO THE WISE

A definition here, a shortcut there — our information swap can help you stay one step ahead of frustration.

By THE STAFF OF INCIDER/A+

ROM AND OPERATING SYSTEMS

It's *inCider/A+* to the rescue as we define two more basic computing terms. With a little help from Gus (last month's visual aid), we're going to discuss *read-only memory* (ROM) and *operating systems* (OS). When we last saw our hero, he was standing in the middle of a library, acting as your computer. (See "Potpourri of Tips," July 1991, p. 72.) His brain made a cameo appearance as random-access memory (RAM), and the library showed great depth in the part of your disk drive.

From that first meeting with Gus we know that he has a limited memory, and is good about following specific instructions. But do we know much else about him? Is he friendly? Is he easy to talk to? What makes Gus different from anyone else? These qualities, which we could call Gus' "personality," are determined by your computer's read-only memory (ROM). The instructions in ROM are etched permanently by the manufacturer and are the most basic instructions your computer has. They interact directly with the system hardware, including the microprocessor, the video display, and the keyboard. In Gus, these instructions would also control his breathing, heartbeat, and basic motor functions.

The Apple II series' ROM is a lot less comprehensive than the Macintosh's. The

first action an Apple II takes when you turn it on is to look for an operating system (librarian) and to load it from a hard- or floppy-disk drive. The *instructions* for loading the operating system are in ROM — not the operating system itself. If you turn on an Apple II without loading GS/OS or ProDOS, all you get is an Applesoft BASIC prompt. You can write programs, but you can't save them, nor can you load or execute any programs from disk. You don't get any mouse support or menus, either — just a blinking cursor and what programmers call a *command-line interface*, meaning you type commands by hand.

Apple IIs need programs to tell them how to do anything complex. Specifically, they need to load an operating system into memory in order to use a disk drive and execute programs. If Gus were like an Apple II, he'd know how to go into the library, but if there were no librarian (operating system) available, he couldn't get any books off the shelves.

Currently, the two most popular operating systems for the Apple II series are ProDOS (professional disk operating system) and GS/OS (GS operating system). GS/OS is a much friendlier librarian; Gus can just point to a book and GS/OS will take it off the shelf and open it for him. ProDOS is grumpier: Gus has to write down the exact name of a book and the shelf it's on, and if the book isn't exactly where Gus says it is, ProDOS will scream, "FILE NOT FOUND." On the other hand,

once you get to know ProDOS, writing a program for the "librarian" is much easier — GS/OS doesn't understand BASIC at all. Also, GS/OS won't even speak to Gus' little sisters (IIe, IIf, IIf Plus, II Plus, and II).

Gus' big brother, Mac (any Macintosh), doesn't use ProDOS or GS/OS. In fact, Mac doesn't even use the same libraries as Gus. With the help of a Macintosh program called *Apple File Exchange*, Mac and Gus can swap information, but they can't use each other's programs. In some ways, Mac is smarter than Gus, because he needs a librarian only for special tasks such as talking to a printer or communicating over a network, or if the library is especially big (like a hard disk). Mac has many routines and functions already in his ROM. But again, while Mac is friendlier, writing programs for him is also harder.

Next time — system extensions or "alphabet soup." — C.C.

COMMAND PERFORMANCE

One of the neatest things I've found that you can do with *Microsoft Word* is define your own command keys and add commands that aren't shown ordinarily on the menus. If you choose *Commands* from the *Edit* menu, you get a dialog box with a scrolling list of every command available in Word. If you see a command you like, you can add it to any menu and assign it a command key. For instance, one of my favorite AppleWorks attributes is the ability to use the keyboard to move to the beginning or the end of my document. So in Word, I selected *Move to Start of Document*, chose the *Utilities* menu, and clicked on the *Append* button. Then I clicked on the *Add* button under *Keys* and typed Command-1. I repeated this process for *Move to End of Document*, but used Command-9. Now I can move to the beginning or end of my documents without having to use the mouse. — C.C.

MACROBIOLOGY

While most of us learned French, German, or Spanish in high school, there were always the twisted few who embraced Pascal or Cobol, instead. While we were practicing "Buenos dias" and "Guten Tag," they were babbling on about nested loops.

Before macros were invented, you needed a degree in molecular keyboard physics to be a programmer. But not now. A macro is a series of commands you teach a program to execute at the touch of a key. Some programs have macros built in, and some let you create macros yourself. It isn't necessary to understand the basic structure of macros to use them, but it's helpful to know how one works if you intend to write your own.

Beagle Bros' *TimeOut UltraMacros* is a popular program that lets you create macros for AppleWorks. While the programming syntax may vary from program to program, here are a few basic macro concepts presented from the view of an UltraMacros user. Follow this syntax: oa = Open apple; sa = Solid apple (or Option); ba = both apples; ctrl = control key.

To "call" a macro from the keyboard, hold down the command key(s) and tap the character key with which it's combined. Here's a common "Add a file to the Desktop" macro: A:<all><oa-Q><esc><rtm><rtm>!

Let's define its parts:

- **A:** is the *macro token*, which identifies the keystroke that launches the macro. It's always followed by a colon (:). The solid-apple keypress is assumed and doesn't have to be written into the code.
- **<all>** is the *domain token*, which indicates from which modules of AppleWorks this macro can be called.
- **<oa-Q><esc><rtm><rtm>!** is the *command token*. A sequence of commands is always followed by a closing angled bracket (>) and an exclamation mark (!). This tells UltraMacros that the sequence has ended.

— Will Nelkin, San Rafael, CA,
author of *ULTRA-AppleWorks*
and *UltraAwesome Macros*

SEND YOUR MACROS TO *inCIDER/A+*, ATTN: MACROS, 80 ELM STREET, PETERBOROUGH, NH 03458. PLEASE INCLUDE ANNOTATION OF YOUR MACROS AND ADEQUATE DOCUMENTATION. SUBMISSIONS MUST BE ORIGINAL MATERIAL COMPOSED BY THE AUTHOR.

MACRO TOKEN

With just a single character, angled brackets aren't required, but if you have a token with two or more characters you must embrace it with angled brackets. A single character always refers to a solid-apple keystroke combination <sa-A>. If you wanted to you could write it as: <sa-A>:<all><oa-Q><esc><rtm><rtm>!

This example isn't case sensitive. Except for a few "reserved macro tokens" (noted in the UltraMacros manual), you can combine any keyboard character with sa-, sa-ctrl-, ba-, or ba-ctrl- keystrokes, including the following command-key tokens:

<esc> — escape key (also <ctrl-I>)
<tab> — tab key (also <ctrl-I>)
 — delete key
<rtm> — return key (or enter) (also <ctrl-M>)
<spc> — spacebar
<left> — left-arrow key (also <ctrl-H>)
<right> — right-arrow key (also <ctrl-U>)
<down> — down-arrow key (also <ctrl-J>)
<up> — up-arrow key (also <ctrl-K>)

Most of the above list have control-key equivalents. (Be careful you don't duplicate these inadvertently.)

DOMAIN TOKEN

<all> indicates functions in all AppleWorks and TimeOut modules.
<awp> indicates functions in the AppleWorks word processor only.
<adb> indicates functions in the AppleWorks database only.
<asp> indicates functions in the AppleWorks spreadsheet only.
<ato> indicates functions in a TimeOut module only (active in AppleWorks 2.0 and higher only).
<asr> indicates function only as a subroutine of another macro (active only in AppleWorks 3.0).

COMMAND TOKENS

A command token may be an AppleWorks command, command key, or UltraMacros command. In our example, commands are separated by angled brackets (<>). This notation helps the novice user see individual commands at a glance. UltraMacros also permits commands to be separated by colons (:) if preferred, as here:

<oa-Q : esc : rtm : rtm>!

You can separate most commands by spaces alone, but some require colons or angled brackets. (Consult the UltraMacros manual.) The colons and/or spaces between commands aren't included in the byte count by the macro compiler and may be used freely, as below, if it suits you:
<oa-Q:esc :rtm :rtm>!

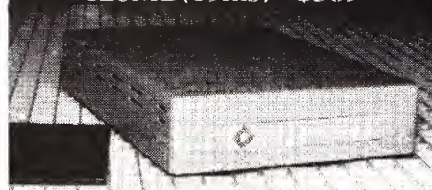
Hard Drive

for IIs, Iie & Mac
w/ Apple Hi Speed SCSI Card



Half Shell -- the hard drive that is 30% smaller than the floppy drive 1.4"x5.5"x7.5"

40MB(25ms) - \$419
120MB(19ms) - \$589



A-Hive Jr. -- small size

7.1"x7.1"x2.2"

Hard drive	32MB	\$459
	40MB	\$459
	60MB	\$559
	84MB	\$589
	120MB	\$629
	170MB	\$919
	200MB	\$979

Tape drive 155MB \$499

A-Hive -- expandable

9.9"x9.6"x4.3"

Hard drive	32MB	\$479
	40MB	\$479

Cartridge drive 44MB \$629

Hard/tape drives combo

Hard/cartridge drives combo
add \$79 for RamFast card
Hard Drive for Laser 128



Tulin Corporation

2156H O'Toole Ave.
San Jose, CA 95131
Tel: 408-432-9025
Fax: 408-943-0782

A REVOLUTION IN COMPUTER LITERACY

By DAVID D. THORNBURG, Ph.D.

In Victor Hugo's classic *Notre-Dame de Paris* (known familiarly as "The Hunchback of Notre Dame"), a memorable exchange takes place between the archdeacon and King Louis XI. The archdeacon is looking at a book created on the newly developed printing press and, pointing toward the cathedral, says, "Alas! This [the book] will kill that [the church]." Hugo explains that, until Gutenberg's time, architecture was the principal universal form of "writing." The expense of architecture ensured that its "stories"



were limited to those dictated by the people with the money or power to bring buildings into existence. With the invention of the printing press, the low cost of books enabled all to write and read. In Hugo's words: "The invention of printing was the greatest event in history. It was the parent revolution: It was the fundamental change in mankind's mode of expression When put into print, thought is more imperishable than ever; it is volatile, intangible, indestructible; it mingles with the air. In the time of architecture, it became a mountain, and itself master of a century and a region. Now

it has been transformed into a flock of birds, scattering to the four winds and filling all air and space."

In this age, we're at the start of another revolution in the technology of expression and the gathering of information. Ten-year-old children sitting at their computers equipped with CD-ROM drives have at their fingertips more information than was available in the Vatican library at

the height of the Renaissance. Furthermore, they have faster access to this information and to searching and place-marking tools that enable them to explore a topic, make links at will, and then organize the information in a form that connects with their specific interests or tasks. In short, children can create meaning from information at the speed of thought.

While I believe the traditional book will survive into the foreseeable future, it will receive incredible pressure from our electronic media. This pressure will come from many sources. First, the cost of CD-ROM publishing is much less than the cost of book publishing. Second, CD-ROM-based material can be accessed quickly in numerous ways, ranging from free browsing to highly focused searches for specific information. In addition to the text and graphics found in books, CD-ROMs can contain animated sequences and computer programs, and they can provide an opportunity to interact with information in numerous ways. CD-ROMs are easy to handle, too — imagine a 21-volume encyclopedia on a little disc.

Just as audio CDs have displaced vinyl as the distribution medium for sound, CD-ROM will displace paper as the distribution medium for reference materials, manuals, and other "nonliterary" works. (Replacing the pleasure of reading books of fiction and literature and other works for which speed and ease of access aren't important is probably a lot further down the road, and is a debatable point, anyway, among book lovers.)

THE POWER OF THE MEDIUM

It's interesting to speculate on the impact this medium — a \$2 disc with a capacity of 250,000 pages of text, 6000 graphics images, or 70 minutes of compressed video — will have on society. One can certainly claim that in that earlier information revolution Gutenberg was Luther's enabling force for the Reformation, just as the audio cassette tape enabled the overthrow of the Shah of Iran in our own time.

If you have yet to explore the power of CD-ROMs in your classroom, you should ☛

RAM Expansion

Super Expander Boards

//c 64K Extended.....\$29
SE//e w/1024K..LOOK!...\$109
SE//c w/1024K.SAVE!...\$119
SE II+ w/1024K.DEALS..\$119
16K Language Card II+.....\$19

Apple IIgs RAM Cards

1 Meg Card w/1 Meg...\$59
GS Juice Plus 4096K
1024K.....\$99
2048K.....\$139
4096K...SAVE!!!.....\$199

RAM Chips & SIMMs

Expand Your....

GS Juice Plus, Chinook 4000
AE GS RAM Plus, CV Tech
41000 (1 Meg x 8).....**\$6.00 ea**
Set of 8 1 Meg x 8.....**\$46.00**
41256.....ea. **\$1.50**
768K Set for Apple 1 Meg Card
24 Chips.....**\$32.00**

Expand Your....

RAMPak 4 GS
AE GS RAM Ultra
44256(256K x 4).....**\$6.00 ea**
Set of 8 256K x 4.....**\$46.00**
OctoRAM & Harris Labs
256x8 SIMM.....\$12.00
1024x8 SIMM.....\$48.00

The Power II Be Your Best!

We Stock old and hard to Find items. If you have a special need, give us a call....

SCSI Hard Disks

Incredible Deals!

20 Meg SCSI.....\$229
40 Meg SCSI.....\$335
80 Meg SCSI.....\$495
SCSI Case & P/S.....\$79

Super Savings!

100 Meg SCSI.....\$539
130 Meg SCSI.....\$595
200 Meg SCSI.....\$795
We Have SCSI Cables!! Call!

Disk Drives & Blank Media...

Drives and Parts..

5.25" FH (20 Pin).....\$65
5.25" FH (DB-19).....\$75
Apple Disk II (Refurb).....\$85
5.25" //c Internal.....\$89
800K Drive Assy w/exch.\$135
Disk II --> DB19 Cable.....\$14

5.25" & 3.5"

5.25" DSDD Disks.100 for \$19
5.25" ...SAVE!..... 500 for \$85
3.5" DSDD Disks.....50 for \$20
3.5" HD Disks.....10 for \$8.50

Manuals &

Other Accessories...

ProDOS Users Man.& Disk\$15
AppleWorks 1.2 Package..\$35
AppleWriter 2.0 Manual....\$12
Other manuals..\$7, \$12 & up...

Koala Pad.....\$29
No Slot Clock.....\$27
Joystick.....\$9-\$29
Misc Computer Covers..\$12.95

Check out these prices...

**We Buy
Surplus
&
Unwanted
Items.
Call For
Details**

Alltech Electronics Co., Inc.

602 Garrison St. Oceanside, CA 92054

619/721-7733 • FAX 619/721-2823

Hours: Mon-Fri 10:00AM-7:00PM • SAT 10-5PM PST

3 Southern California Locations

**Fax Your
Order &
Recieve
a 2ndDay
Shipping
Upgrade
Free**

Keyboards

Apple IIe or IIc w/exch.....\$65
Apple II+ or III.....\$45
Macintosh 128K/512K.....\$65
Numeric Keypad II+/Mac.....\$35

Apple II Chips

Apple IIgs Specific Chips

IIgs ROM01.....344-0077B.....\$29
IIgs VGC.....342S0046.....\$45
Apple IIe & IIc Specific Chips
6502\$3.00
65C02 (CPU).....\$9.00
MMU...342-0010 / 342-0011...\$29
IOU...342-0020 / 342-0021...\$29
CD/EPROM...342-0135/0134...\$19
AY3600PRO.....(kybdencdr).....\$29
Video ROM...342-0133/0265.....\$19
IIe & IIc HAL, GLU or TMG.....\$9
Keyboard Map...342-0132...\$19
Apple II+ Parts.....Call

Call For Others Not Listed!

Printers & Heads

ImageWriter I w/exch.....\$75.00
ImageWriter II w/exch.....\$89.00
C-ITOH/AppledMP w/exch..\$75.00
Refurbid 9 Pin Printer.....\$95.00

Our Policy:

**CA Residents please add 7% sales tax
Minimum Shipping & Handling:
\$5.00.**

**Some Products may be
used/refurbished. All products come with a
90 day warranty. Inquire at time of purchase
for info on specific products. No returns
without an RMA#. Refunds are subject to a
20% restocking charge. We are not
responsible for products purchased in error.
No refunds on S&H charges.
Apple Keyboards, power supplies and other
parts subject to exchange only.
Some RAM Chips may be new but pulled.**

Service Parts

Accessories &...

Motherboards

Apple IIe or IIc w/exch.....\$139
W/o Exchange.....\$169
Apple II+.....\$99
Macintosh 128K/512K.....\$99/\$129
Apple III and Lisa Parts.....Call

Power Supplies

Apple IIe or II+ W/Exchange.....\$39
W/o Exchange.....\$49
Apple IIc Internal P/S.....\$29
Apple IIc External P/S.....\$39
Apple III and Lisa Parts.....Call

Cables/Switch Boxes

IIc-->ImageWriter I/II.....\$12
II+, IIe-->ImageWriter I/II.....\$12
IIgs, IIc-->ImageWriter I/II.....\$12
Apple MiniDin 8 (Both Ends).....\$12
A/B Switch Box...starting @ \$29.00
Disk II 20 Pin to DB19 Cable..\$14
Call for other cable configurations

Monitors

Apple Monitor IIc.....\$79
Apple Monitor III.....\$65
Amdek Color-I Composite 14"....\$105
Refurb Comp Green/Amber.....\$35.

Peripheral Cards

80 Col Card II+.....\$45.00
5.25" Disk Cntrl..(20Pin/DB19)...\$39.
3.5" UniDisk Cntl (Smartport)...\$58
Graphic Parallel Printer Card...\$45
Super Serial Card.....\$52
Z80 CPM or Hayes Modem300...\$29
System Saver IIe.....\$35
Mountain CPS II+.....\$45

Apple Cases

Apple IIe or IIc.....\$45
Apple II+.....\$19
Macintosh (128/512).....\$45

School Purchase Orders Accepted!

Apple II Forever! • The Power II Be Your Best • This advertisement was produced using AppleWorks 3.0 & PageMaker 4.0 Together, the best of both worlds!

look around and see what's available. There's something for every taste and subject. The **Educorp** catalogue (800-843-9497) lists a variety of commercial and shareware collections for the Macintosh (CD-ROM development for the II is lagging behind), and new titles are coming out weekly. The **Audubon Birds of America** disc contains not only beautiful pictures, but high-quality recordings of bird calls. The **Electronic Map Cabinet** produces clean, professional maps of more than 80 percent of the populated United States. A similar catalogue is available from the **Bureau of Electronic Publishing** (800-828-4766).

Other discs provide courses in foreign languages, and the **Discis** collection contains wonderful applications based on favorite children's stories. (For more information see "Compact Discovery," April, p. 80, and May, p. 88, and "CD-ROM Comes of Age," May, p. 44.)

Even if the cost of providing Macs to all your students is prohibitive, there are some

solutions. If you already have a labful of Apple IIs, perhaps you could get a Mac-based CD-ROM system for information retrieval in the school library. Students working with disc-based encyclopedias can capture text, put it on a Mac disk, and use the Mac's Apple File Exchange utility to convert it to Apple II format.

The revolution is now. I envision the day when we might hold a CD-ROM disc in one hand and, pointing to a textbook, say, "This [the CD-ROM] will kill that [the textbook]." □

WRITE TO DAVID THORNBURG AT 1561 LAUREL, SUITE A, SAN CARLOS, CA 94070. ENCLOSE A STAMPED, SELF-ADDRESSED ENVELOPE IF YOU'D LIKE A PERSONAL REPLY. DR. THORNBURG'S LATEST BOOK, *EDUCATION, TECHNOLOGY, AND PARADIGMS OF CHANGE FOR THE 21ST CENTURY*, BUILDS ON SOME IDEAS HE'S SHARED RECENTLY IN THESE PAGES ON THE WAY COMPUTERS AND OTHER TECHNOLOGIES CAN HELP RESHAPE EDUCATION. TO RECEIVE THIS BOOK, SEND \$10 TO DR. THORNBURG, ATTENTION *EdTECH BOOK*.

CD-ROM SOURCES

Discis Knowledge Research, Inc.

5150 Yonge Street
North York, Ontario
Canada M2N 6N2
(416) 250-6537
(800) 567-4321

Grolier Electronic Publishing, Inc.

Sherman Turnpike
Danbury, CT 06816
(203) 797-3500
(800) 356-5590

The WordBox! Company

P.O. Box 1115
Belmont, CA 94002
(415) 592-5447
(for IIs computers only)

Warner New Media

3500 Olive Avenue
Burbank, CA 91505
(818) 955-9999

Wayzata Technology, Inc.

P.O. Box 87
16221 Main Avenue S.E.
Prior Lake, MN 55372
(800) 735-7321
(612) 447-7321
(for Mac and IIs computers)

The Voyager Company

1351 Pacific Coast Highway
Santa Monica, CA 90401
(213) 451-1383
(800) 446-2001

The Solution To



Not enough memory to open file.



IS



The RAM 4000

- 100% DMA compatible
- Supports 1,2 and 4MB configurations
- Supports both ROM 1 and ROM 3 IIGS, no alterations
- Multi-layer printed circuit board construction
- 5 year warranty and 30 day money back guarantee
- No 900 tech support like Applied Engineering™

RAM 4000™, 1MB \$149

Additional Memory 59.95/1MB bank



615 Main St., #635
Longmont, CO 80501
303/678-5544
FAX: 303/772-1395
Tech: 303/678-5007

To Order, or for additional
information and catalog, call:
800/999-7034

Shipping information:

Hard drives, \$9 UPS Gnd. \$18 2nd day.
RAM cards, \$4 UPS Gnd. \$7 2nd day.

SCSI

Buying a hard drive is a confusing experience these days. Read the ads, everyone says their drives are the best. Great we say. Talk is cheap.

We've been selling hard drives to the Apple II market for over 3 years. We know Apple II's and we know SCSI hard drives.

For example, most of our competition's hard drives are internally terminated. A great idea until you add more SCSI devices. We're not sure why they do it. Why don't you ask them. Then ask us.

CT-40	25ms	\$409
CT-80	17ms	499
CT-100	15ms	629
CT-200	15ms	859
Apple HS SCSI		99
RAM Fast v2.0		185

IIC Hard Drive



By popular demand, our hard drive for the IIC and IIC Plus has returned. 20 and 40 and 80 megabyte models are available. Call for additional information and brochure.

800/999-7034

C-Ram

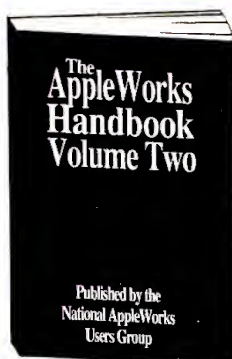


Add expansion memory to your Apple IIC, with memory expansion connector, and IIC Plus.

C-Ram (256K)	\$119.00
Add'l Memory	24.95/bank

MARKETPLACE

Marketplace Ads get results! You can place an ad in this attention-getting section at a very reasonable cost. Call Diane toll-free at **800-441-4403** for helpful advice and reservations. Start seeing your ad here next month.



- Hundreds of AppleWorks tips, hints, and ideas.
- Over 500 pages and 200 articles, each a separate AppleWorks lesson.
- Useful techniques for novice, intermediate, and advanced users.
- Satisfaction guaranteed or your money back.
- Only \$27.95 plus \$3.50 shipping. (\$8 foreign).

Send check or VISA/MC to:
National AppleWorks Users Group
Box 87453
Canton, MI 48187
(313) 454-1115

The 'How To' Book

Circle 55 on Reader Service Card.

THE APPLEWORKS EDUCATOR

The only publication devoted exclusively to educational AppleWorks users.

The AppleWorks Educator will help you:

- Learn new tricks and techniques for AppleWorks "classic," AppleWorks GS, and add-ons from Beagle Bros' TimeOut series.
- Save time and find inspiration through exclusive news updates and reviews of new AppleWorks educational resources.
- Work quicker and more productively using AppleWorks for material preparation, student tracking and report generation.
- Make your classroom more dynamic and "hands-on" through thoughtful computer integration at whatever grade or discipline.
- Find relevant advice whether you are an AppleWorks novice or school expert.
- Save money through our subscriber discounts on many educational AppleWorks materials.

Bimonthly publication entering its sixth year
— plus new yearly template and file disk
with summer issue

Subscriber Options:

- **Level 1 - Subscription** (includes yearly template disk) \$25 for one year or \$48 for two years.
- **Level 2 - Extra Value and Savings** Subscription (including yearly template disk) + **Bonus Teacher Resource Disk** (double sided, filled with useful sample, resource and tip files) \$34.95 for one year (over \$3 savings) or \$57.95 for two years.

Add \$3 billing charge for Purchase Orders without payment. Canada/Mexico add \$3/yr. postage, foreign air mail \$15/yr (US funds on US bank).

Check and money orders to The AppleWorks Educator, P. O. Box 72, Leesdale, PA 15056, (412) 741-5129. SATISFACTION GUARANTEED!!

Circle 6 on Reader Service Card.

Ilgs Blowout!
Reconditioned
ONLY \$569.
800k external (Apple®).....\$199.
Mac LC 2/40.....\$1795.

Parts!

Apple II, Macintosh & IBM PS/2

Shreve Systems

3804 Karen Lane
Bossier City, La. 71112

FAX 318-742-2799

800-227-3971

School & Government P.O.'s accepted!

Circle 29 on Reader Service Card.

LASER 128 Apple IIe Compatibles

	Computer	w/Amber	w/RGB
128	289	378	489
128EX	359	448	559

Largest LASER Repair Center and Educational Dealer in Southeast.



- Amber Monitor.....95
- Kraft KC-3 Joystick.....25
- Zoom 2400 Modem.....89
- Mouse for Laser or Ilc.....45
- LASER 2-slot Expansion Box.....49
- Safeskin Keyboard Protector for Laser.....20
- UDC card: connect 3.5 Drive to Apple Ilc.....45
- LASER PC-4 Portable for Macintosh.....222
- LASER 3.5 Drive.....119
- LASER 5 25 Drive.....89
- LASER 14" RGB color + green + tilt & swivel.....215
- Magnavox Color for Ilc.....288
- RGB for Ilgs.....308
- Ilc Printer Card w/cable: Parallel.....45
- Super Serial.....66
- Laser Pal286 w/VGA Color....."software like a Mac".....1275

Memory

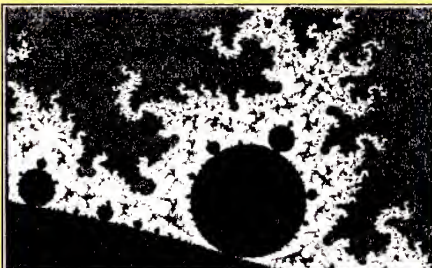
- Chips for Ilgs: 1 meg.....58
- for Laser & Apple: 256K.....20
- RAM Card for Ilc.....59
- Ilgs.....69
- Ilc.....79
- Laser 128.....25
- 128K Card for Ilc w/80 column + Hi-Res graphics.....25

III LASER Experts 1-800-726-7086

LASER 190A ImageWriter Compatible Printer for Ilc, Laser.....189 for Ilgs, Ilc, Ilc+, Macintosh.....213

Perfect Solutions (407) 790-1070
12657 Coral Breeze Dr, W. Palm Bch, FL 33414

Circle 59 on Reader Service Card.



New Software for Ilc, Ilc, Ilgs

Apex

- **FRACTAL FINDER**—Combine science, math and art to create fantastic color images. Includes magnifier, detail enhancer, quick-look and image colorizer. Ilgs version includes kinematic effects.
- **APEX BUILDER**—Write graphics desktop applications on your Ilc, Ilc, or Ilgs. More than 200 commands plus rare double-HIRES color graphics.

My computer has 128K memory.
Send 5 1/4" disk with:

- ☐ **Fractal Finder** (Ilc, Ilc, Ilgs)\$ 9.95
- ☐ **Fractal Finder** (for Ilgs)\$14.95
- ☐ **Apex Builder** (disk & manual)\$39.95

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

☐ Ilc ☐ Ilc ☐ Ilgs ☐ Laser 128K

Enclose cash, check, or money order. (Add \$5 for 3.5" samples disk. Overseas — add \$5 for air delivery.)

MAIL TO:

MICROGRAM SYSTEMS

P.O. Box 252, La Honda, CA 94020-0252

Tel.: (415) 747-0811

Ilgs is a trademark of Apple Computer, Inc.

Circle 13 on Reader Service Card.

Unleash the Hidden Audio Powers of Your Apple II

The Shan's Digicorder (D.C.R.) allows any Apple II (+, e, c, GS) or compatible to play real world sounds, like natural human speech in any language, multi-timbral poly-phonic music etc., through your Apple's built-in speaker, with out requiring any additional hardware. You can easily create (Digitize) sounds, using its graphic user interface. Later you can play them back with or w/o special-fx like Flange, Mix, reverse and more from your own Basic / M.L. programs. Your programs with the sounds may be distributed on disk, without paying any cash royalties, so that it may run on any Apple.

Just US\$ 49.95 (incl. Air Mail). Demo disk for \$4 (fully refundable when your order). Free catalog. **ORDER NOW AND GET DCR (FREE GIFTS TOO) FOR ONLY \$39.95 (add \$5.00 for shipping).**

And now, to introduce you to the D.C.R. (and to us) take part in the **Cybergensis-Sweepstakes** 1000s of prizes with a trip for 2 to India as 1st prize. Every contestant is a winner, as they will receive a free custom printed shirt (not a T-Shirt).

Entry forms inside every D.C.R. pack. For more details, contact your dealer or write to us. **HURRY!** contest closes 15th Nov, 1991.

Write (F.M.) or our exclusive offers for you.

Cybergensis

Vatanappally - 680614 Kerala India

Circle 26 on Reader Service Card.

2 POWERFUL SOFTWARE PROGRAMS from

COMPLETE MATHEMATICAL PROGRAMS for
HIGH SCHOOL AND UNIVERSITY STUDENTS
or WORKING PROFESSIONALS



GSNumerics

for the APPLE IIGS COMPUTER

- SCIENTIFIC CALCULATOR • Atomic Weight & Number • 196 Unit Conversions • Automatic Function Parsing • Complex Math • 64 Functions
- POLYNOMIAL & NON-POLYNOMIAL OPERATIONS • Solve for y • Slope • Area • Roots • Integrate & Differentiate Polynomials
- x-y REGRESSION • Linear • Log • Exponential • Power
- SYSTEMS OF LINEAR EQUATIONS • Real or Complex, up to 10 x 10
- MATRIX OPERATIONS • Add • Subtract • Multiply • Scalar Multiplication • Transpose • Inversion • Determinant • Real or Complex up to 10 x 10
- COMPLETE FILE OPERATIONS
- GRAPHICS • Polynomials • Non-polynomials • x-y Data • Regressions • Graph Magnification • Overlay Two Functions • Overlay Function and Derivative • Overlay Function and Integral

MacNumerics

for the Macintosh Computer

The NEW MacNumerics has all the basic functions and features of GSNumerics PLUS...

- POLYNOMIAL OPERATIONS • Enter In Polynomial Form • Enter In Factored Form • Enter As A Factor Power Expansion • Factor Polynomials With Real And Complex Factors
- GRAPHICS • Compute And Display Real Roots • Compute And Display Area Between Two Points • Compute And Display Common Solutions • Compute And Display Area Between Two Functions
- SHOW COMPUTATION STEPS

TWO POWERFUL TOOLS FOR TEACHING AT
THE HIGH SCHOOL & UNIVERSITY LEVELS
For complete information contact:

Spring Branch Software, Inc.
P.O. Box 342 • Manchester, IA 52057
Phone: (319) 927-6537

Circle 60 on Reader Service Card. Circle 3 on Reader Service Card.

Bible Software

Find any verse in the Bible, search for any word or phrase. Easily find the exact verse you need for your study. Build personal concordances to the Bible. We also offer a topical index and a Greek transliterator. For ProDos, Macintosh & MSDOS. Call for a FREE brochure.

(800) 423-1228

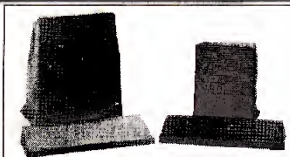
Bible Research Systems

2013 Wells Branch Pkwy #304
Austin, Texas 78728
(512) 251-7541

Circle 87 on Reader Service Card.

DUST COVERS

Gray
Navy
Royal



Tan
Red
Brown

100% Fabric Dust Covers

- Heat Ventilating, Unlike plastic, and Won't Dry Out, Yellow or Crack with age! • Machine Wash & Dry!
- Highest Quality, Custom-Fit Designs! • For Apple, MAC, IBM, Compaq & many more! • Custom orders! • Monogramming and Silk-screening Available!
- 100% Satisfaction Guarantee! • Service since 1983!
- 10-62 Iigs, RGB Mon & Kbd. 29.95 95-24 Laser 128 CPU 15.95
- 10-87 Iigs, KSS, RGB & Kbd 29.95 10-60 Apple 3.5" Drive 6.95
- 10-96 Iigs, RGB & Kbd (3 pc) 34.95 10-38 Apple 5.25" Drive 6.95
- 10-67 Iigs Keyboard Only 6.95 10-59 3.5" on top 5.25" 9.95
- 10-16 Ics & Monitor Iic 24.95 11-30 Mac Classic & Kybd 24.95
- 10-51 Iic & Color Mon Iic 28.95 11-32 Mac C 12" Mtr & Kybd 29.95
- 10-17 Iic External Drive 6.95 11-36 Mac IIs 13" Mtr & Kybd 29.95
- 10-58 Iic & Iic Color Monitor 29.95 10-37 ImageWriter II 15.95
- 10-34 Iic Computer Only 15.95 10-30 LaserWriter II 24.95
- 10-32 Iic Color Monitor Only 19.95 11-25 Personal LaserWriter 24.95
- 10-07 Iic & Iic Mono Monitor 24.95 11-52 StyleWriter 15.95

Add \$4.00 Shipping & Handling (Check, MC, COD, VISA/MC)

CO-DU-CO Computer Dust Covers
4802 W. Wisconsin Ave., Milwaukee, WI 53208
800-735-1584 • 414-476-1584 • 414-476-9329 FAX

Circle 21 on Reader Service Card.

RIBBONS

1-800-331-6841

1-513-252-1247

FAX 513-252-4429

Over 350 types

Volume Discounts Available

★ Satisfaction Guaranteed ★

	BLACK	COLORS
APPLE IMAGEWRITER	2.40	2.95
APPLE 4-COLOR	-	5.50
APPLE SCRIBE	5.95	-
CITIZEN 200GX/GSX-140	3.50	13.50
EPSON LX-80/80	2.10	3.50
EPSON MX-FX 80	2.50	4.50
EPSON MX-FX 100	3.50	4.50
IBM PROPRINTER	3.50	-
OKIDATA 182-192	3.50	4.50
PANASONIC 1080	3.50	4.50
PANASONIC 1124	4.95	4.50
STAR NX-1000	3.25	3.95
NX-1000 4 COLOR	-	7.50

DAYTON COMPUTER SUPPLY

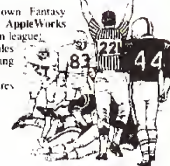
a division of Den-Sye Corp
1220 Wayne Avenue, Dayton, Ohio 45410

Est:1979 TERMS: C.O.D., MC, VISA, DISCOVER, AMEX.

Circle 134 on Reader Service Card.

Fantasy Football for the Apple II

Welcome to FantasyWorks!
Everything you'll ever need to run your own Fantasy Football League as commissioner. Includes AppleWorks files and templates for managing a 4 to 12 team league.



• Fantasy Season Schedules • Fantasy Rules

• Automated Standings • Financial Tracking

• Complete 1991 NFL Players Databases

• Report Generation and much more. Requires

AppleWorks 2.0 or higher.

FantasyWorks also includes:

• TimeOut UltraMacro TaskFiles for

Computing Fantasy Points with multiple

scoring methods. Automatic Generation of League Rosters and more. Requires

TimeOut Enhanced AppleWorks.

• Communications macros that automatically capture NFL statistics from Computer

Sports World for Fantasy Point scoring. Macros work with popular

communications products such as DataTerm, Point-to-Point, ProTerm, ReadyLink,

and Talk-Is Cheap. Requires specific communications software package and

H Hayes AT compatible modem.

• Templates and tips for creating your own Weekly League Newsletter using

Publish II! Desktop Publishing Software. Requires Publish II 2 or 3.

• Over 30 different Fantasy League Forms to get you started

All this plus an in-depth Fantasy Football League Manual that fully covers the use of

this software and explains what Fantasy Football is all about. Don't delay! The NFL

season is only a few weeks away.

FantasyWorks™  

File Fantasy Football League Management System - from FantasyWorks Software for

the Introductory Price of \$79.95 + S&H Demo disk \$5.

Please call or write for a free brochure:

FantasyWorks Software, Inc.
P.O. Box 57
Bedford, TX 76095-0057
(800) 727-4103

Apple II is a registered trademark of Apple Computer, Inc. TimeOut is a registered trademark of Beagle Bros. Inc. All other products are trademarks of their respective companies.

Circle 94 on Reader Service Card.

Slide-On
Slide-On
Slide-On
Slide-On

Battery Kit

- Complete Instructions
- No Solder Required
- Heavy Duty Battery
- 10 Year Shelf Life
- Patent Pending

Thousands of satisfied owners have found that our replacement battery kit is the best way to replace a dead soldered clock battery on early models (ROM 1.0) Apple IIGS and MAC SE.

Satisfaction
Guaranteed
\$14.95 ea.
10 Kits for \$120

Invisible Ink

Security Pen - Mark your valuables for fast recovery. Visible under UV light. \$3.95

Include \$2 S/H per Order (\$5 overseas)

FAX: 362-5798

Call: (913) 362-9898



Nite Owl Productions
5734 Lamar Street
Mission, KS 66202

Circle 71 on Reader Service Card.

APPLEWORKS ↔ IBM

CROSS-WORKS 2.0 can exchange AppleWorks data files with the most popular MS-DOS programs:

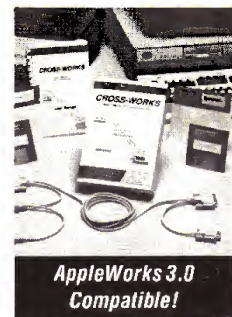
NEW! AppleWorks ↔ Microsoft Works
AppleWorks Word Proc. ↔ WordPerfect
AppleWorks Spreadsheet ↔ Lotus 1-2-3
AppleWorks Data Base ↔ dBase III, IV, etc.

In seconds, CROSS-WORKS copies files either way between your Apple II and IBM PC, and translates the file formats. Word Processor files maintain underlining, margins, centering, etc. Spreadsheets transfer data and formulas! Transfers ASCII text files too. Includes universal 19,200 baud cable to connect IIC (with Super Serial Card), IIC, HiPlus & IIGS to PC, XT, AT, PS/2 & compatibles. Also supports modem transfers. Both 5 1/4 and 3 1/2 inch disks included.

"...Look no further. SoftSpoken's CROSS-WORKS carries the biggest stick in the file translation/transportation business... Rating: ★★★★★" — InCider July, 1989

CROSS-WORKS™ \$99.95 + Shipping & Hand.
30 Day money-back guarantee! School P.O.s welcome.

☎ (919) 870-5694 for free information.



AppleWorks 3.0
Compatible!

SoftSpoken

P.O. Box 18343
Raleigh, NC 27619

Circle 127 on Reader Service Card.



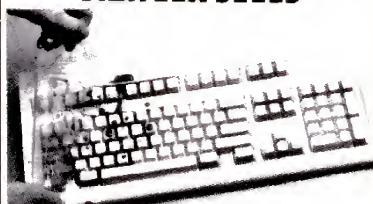
- A quality source of your external SCSI hard disks, tape backups, and combo units. Apple, Mac, IBM compatible.
- An exclusive manufacturer of all FIRST CLASS PERIPHERAL SIDERS. Also provide service, repair, and upgrade on existing models.
- See our AD in the upcoming Issues of this magazine.

1700 Forrest Way
Carson City, NV 89706
Sales: 800-982-3232
Tech Spt: 702-687-2800

• PLEASE MENTION THIS AD •

Circle 16 on Reader Service Card.

A MUST for Computers VIZIFLEX SEELS®



The Ideal Keyboard Cover!

Protect your computer and eliminate downtime caused by liquid spills, contaminants, environmental hazards, etc. with VIZIFLEX SEELS - the only keyboard cover that:

- Remains securely in place during the operation of the keyboard. Does not impede computer performance in any way.
- Is designed to "form-fit" to the exact contours of the keyboard to provide superior tactile sensitivity and feel for individual keys.
- Consists of a durable matte finish material that eliminates glare while keeping all keyboard markings clearly visible.

Available for over 600 popular keyboards. VIZIFLEX SEELS can be custom designed for any keyboard or similar application. VIZIFLEX SEELS - The only keyboard cover for your computer!

VIZIFLEX SEELS, INC.

16 E Lafayette St., Hackensack, NJ 07601

Tel. (201) 487-8080 • Fax (201) 487-6657

In Canada, call 1-800-668-6570

Call, write or fax for brochure—Dealer inquiries invited

Circle 290 on Reader Service Card.

APPLE MEMORY CHIPS

Guaranteed Lowest Price!

- ★ 2MB SIMM (MAC) \$90.00
- ★ 256K Chip Set (Standard) \$19.95
- ★ 256KX4 Chip Set (AE Ultra) \$14.95
- ★ 1MB Chip Set (AE Plus) \$59.95
- ★ Chinook 4000 4 MB card w/1MB \$134.00
- ★ SE 1 MB card for IIC w/256K \$105.00
- ★ SE 1 MB card for IIE w/256K \$99.00

All type chips available, call for details.

CALL TOLL-FREE 1-800-776-6260



COD

1854 S. Stewart
Springfield, MO 65804
Phone: (417) 883-6261
FAX: (417) 883-2584

Circle 17 on Reader Service Card.

Sports Scheduler

THE BEST MOST COMPLETE LEAGUE PLAY
SCHEDULING SOFTWARE ON THE MARKET.

- Schedule any number of leagues, categories or divisions with 4 to 22 teams in each.
- The date, day, time, location, game number, & home & visitor are calculated for every game.
- Equal distribution of; opponents, teams playing in time slots, byes for odd number of teams, home and visitor status, and the number of games.
- Games are listed in chronological order by date and time arranged in sets and round robins.
- Only minutes to create/print/save a schedule.
- Saved schedules can be recalled into APPLEWORKS providing unlimited editing and printing options. You select desired file format: word processor, spreadsheet, or data base.
- Prints mailing labels and league/team contact rosters for each league, category or division.
- Create scheduling organization/setup worksheets.

Bonus - Referee/Facility Scheduler included free.
Apple IIe, c, IIGS (5 1/4 disk) \$109.95+\$3.00 S&H
IBM PC & Comp (3 1/2 or 5 1/4 disk) \$129.95+\$3.00 S&H
Call or write for informative brochure:

SPORTS SOFTWARE ASSOCIATES
P.O. BOX 458, HINGHAM, MA 02043
(617) 749-7880

Circle 18 on Reader Service Card.

FREE -15 DISKS - FREE FULL OF GREAT SOFTWARE

TRY US! Get our bestselling
VIRUS FREE software.15/5.25"
disks or 6/3.5" disks for Apple]],
Apple GS or Mac. Games,

Business, Graphics, Education,
Utilities, Finance, and Desktop
publishing. Credit cards only!

PAY ONLY \$5.00 FOR SHIPPING
satisfaction guaranteed

MACINTOSH • APPLE II • APPLE GS

SMC SOFTWARE PUBLISHERS

ORDER TODAY - CALL

619 931-8111



since 1985



Circle 23 on Reader Service Card.

Cheap Buys

Macintosh	Apple //
Mac Plus \$595	Apple //e \$199
Mac Plus/40mb \$995	Apple //c \$249
Mac SE \$895	Disk // \$79

Apple // Software	Accounting
Catalyst //e \$49	BPI GL \$39
Word Juggler //e \$49	BPI AR \$39
Terminus //e \$29	BPI AP \$39
Legal Dictionary \$29	Additional Module \$39

Many more items in our complete catalog.

All computers are reconditioned and come with a 30-day money-back guarantee and a 90-day parts and labor warranty. Call for specific details.

Call 24 hrs. a day for free catalog.



1-800-821-3221

Sun Remarketing, PO Box 4059, Logan, UT 84321

Circle 36 on Reader Service Card.

COLOR RIBBONS & PAPER

Colors: Black, Red, Blue, Green, Brown, Purple, Yellow			
Ribbons:	Black	Color	T-Shirt Ribbons
Apple Image, I, & II	\$3.75	\$4.50	\$6.50
Apple Image, II 4 -Color		\$5.95	\$10.00
CitizenGSX140	\$4.00	\$6.00	\$7.50
CitizenGSX140, 4-Color		☆	
Epson MX-80	\$3.75	\$4.50	\$6.75
Okidata 182/192	\$5.00	\$7.50	
Panasonic 1180/1124	\$5.00	\$7.50	
Star NX 1000	\$3.50	\$4.50	\$6.75
Star NX 1000, 4-color		\$6.25	\$10.00

T-Shirt (Heat Transfer) Ribbons
Colors: Black, Red, Blue, Green, Brown, Purple, Yellow
COLOR PAPER

Color Paper:	200 Shts assorted
Bright Pack:	9 1/2 x 11 \$10.90/pk
Pastel Pack:	9 1/2 x 11 \$7.90/pk
Color Certificate Paper:	100 sheets \$9.95/pk
Color Banner Paper:	45 ft/roll \$8.95/roll

Min. orders: \$25.00 Minimum S&H: \$4.50. Call for other ribbons and supplies. Price and spec. are subject to change w/o notice.

RAMCO COMPUTER SUPPLIES

P.O. Box 475, Manteno, IL 60950 U.S.A.
USA 800-522-6822 or USA 815-468-8081 (Canada) 800-621-5444

Circle 7 on Reader Service Card.

Hard Drives!

30 Day Money Back Guarantee • 1 & 2 Year Warranties
Toll-FREE Tech Support • Highest Quality Service
All Installation H/W and S/W Supplied

20 MB	Ext \$195
45 MB	Int \$219 Ext \$279
100MB	Int \$335 Ext \$369
210MB	Int \$685 Ext \$765
External 337 MB	\$1199
External 676 MB	\$1739
External 1 GB	\$2459
SyQuest (w/cart)	\$445
Classic/SLC 40 MB	\$279, 80 MB \$329

We are a leading-edge, innovative company translating over 20 years of disk drive experience into better opportunities for users today.
Call now to take advantage of this incredible offer.
Frog Systems, Inc.

4301 Oak Cir. Dr. #20, Boca Raton, FL 33431

800-654-FROG

Circle 24 on Reader Service Card.

Only \$29.97!

PUBLISH IT! YOURSELF

inCider/A+'s ready-to-use templates take the frustration out of designing a variety of popular desktop-publishing projects. Use it with Publish It! 2 (or higher)* to create attractive newsletters, brochures, forms and more. Ten projects come on a 5.25" disk with an easy-to-follow instruction booklet.

*Publish It! is a product of Timeworks, Inc.

Canadian orders: add 7% GST.
Foreign airmail add \$3.95. Foreign orders must be paid in U.S. funds drawn on a U.S. bank.

inCider/A+ Special Products

80 Elm Street, Peterborough, NH 03458
1-800-343-0728 (In NH: 924-0100)

181C

Music

ELECTRONIC MUSIC MIDI SYSTEMS

Laminated MIDI Reference Poster, attractive, suitable for framing, for home studio or music classroom, \$19.95 + \$5.50 S/H. Turn your Apple into a Multi-Track Recording Studio or Music Ed. Tutor with these great products: Apple II+, IIe, MIDI Card 1x2 channels \$69, GS/MAC MIDI 1x3 \$59, with Serial Thru Switch and Diode Lights 1x3 Interface \$89. Sequencing software: Passport MasterTracks Jr, GS \$79, MT PRO GS \$259, Dr.T's KCS V. 2.0 IIe/II+ \$159, GlassTracks \$89, Super Sequencer GS, IIe \$179, Apple II or GS MIDI Music Pack: MIDI Interface & Cables & Software \$169, Music Printing Software \$99, Keybrd. Tutor \$39, Chords \$79, Fingering \$79, Note Reading \$39, Intervals \$79., Hear Today Play Tomorrow \$199. 6' MIDI Cables \$7.95. Books \$2.50 S/H each: A Guide To Computer Music, \$19.95; Electronic Music Dictionary \$16.95; Sequencing for Musicians \$17.95; Music and the Mac \$16.95; Polyphonic MIDI Keybrd. with speakers \$389, or Kawai PH50 Keybrd. \$379. MAC, MIDI, MUSIC SYSTEMS. Band in a Box with song disks \$79, Encore Notation \$359, Al Tech new MIDIFACE EX 1X3 Interface plus software \$69, Practica Musica Education software \$99. MT Pro \$259, Pro 4 \$359, Vision \$339, Trax \$79, All Editor/Librarian Mac Software. MIDI Software for any level user; Apple II, Mac, C-64/128, IBM, Atari, Schools and Canadian orders welcomed. New 1991 MIDI Buying Guide Catalog.

SOUND MANAGEMENT P.O. Box 3053

Peabody, Ma 01961
Check, MO, VISA, MC, School P.O.
Call (800) 548-4907 orders USACall
(508) 531-6192 MIDI Buying Guide
catalog and foreign countries

CLAS SI FIED

Software

EUROWORKS ADDS FOREIGN LANGUAGES TO APPLEWORKS

Type French, German, Italian, Portuguese, or Spanish quickly, simply with the classic AppleWorks word processor. Then, from inside AppleWorks, EuroWorks prints your foreign text on an ImageWriter or true compatible. Print every keyboard character plus 8 new ones plus 13 French, 7 German, 10 Italian, 13 Portuguese, or 10 Spanish. No conflict with TimeOut. EuroWorks REQUIRES an ImageWriter I, II, or LQ; Apple DMP; MT85/86; or Seikosha SP-1000AP. SPECIFY APPLEWORKS 2.x or 3.0. ORDER FRENCH (\$24), SPANISH (\$24) or ALL FIVE LANGUAGES (\$39). ADD \$3 S/H. Check, MO, Net-30 School PO, VISA/MC. Brochure on request.

The S.A. AuTear Co A66
PO Box 7459
Beaverton, Oregon 97007
(503) 645-2306

FAMILY ROOTS, LINEAGES, TREE CHARTS

From our collection of software to keep track of your family, choose one to fit your needs and pocketbook! Our software handles gobs of data for each of millions of people. Print pedigree and descendants charts, group sheets, person sheets, indices of names, address labels, more. Do screen tracing and searches. Compatible with your word processor. Call for a FREE catalog. Satisfaction guaranteed! Prices start at \$49. All Apples, Macs, PCs, and more.

MC/VISA/AMEX

QUINSEPT
PO Box 216
Lexington, MA 02173
617-641-2930 (Mass.)
800-637-7668 (USA & Canada)

PLAN-MAKING SOFTWARE FOR ALL APPLE II AND MACKINTOSH PLATFORMS-FEATUREING AWARD WINNING HOME DESIGN PRO- GRAMS FOR THE APPLE II GS

DESIGN YOUR OWN HOME:

ARCHITECTURE Draw floor plans and structural details, prints plans to scale. Apple II, \$69.95, IIGS: \$89.95, MAC: \$99.95.

DESIGN YOUR OWN HOME:

INTERIORS Draw room plans, arrange furniture and explore color schemes. Great for kitchen and bath design! Apple II, \$69.95, IIGS: \$89.95, MAC: \$99.95.

DESIGN YOUR OWN HOME:

LANDSCAPE Create complete landscape plans, age plants to determine correct placement, and prepare shopping list for your trip to the nursery. Apple II, \$69.95, IIGS: \$89.95, MAC: \$99.95.

DESIGN YOUR OWN RAILROAD:

Apple II: \$49.95. Design precision, to-scale (H,O,N,Z,O,S,G) layouts and run realistic railroad simulations.

DESIGN YOUR OWN TRAIN:

Apple II: \$49.95. The train and transit system construction set.

RUN YOUR OWN TRAIN:

Apple II: \$34.95. The flight simulator for down to earth people.
.Check/Visa/MC.

ABRACADATA

PO Box 2440 Dept. DD

Eugene, OR 97402

Orders: (800) 451-4871

Information: (503) 342-3030

Public Domain

BEST VALUE IN APPLE PUBLIC DOMAIN

NOW ACCEPTING MC/VISA/DISCOVER!
Largest selection available, over 1200 disks, packed, organized and MENU-DRIVEN with only the best PD and Shareware. Our library is continually updated and now includes many of the latest releases for the Apple IIGS! We emphasize quality and service with NEXT DAY shipping available. Disks as low as \$1.00 each and include all categories (Utilities, Education, Business, Games, PRINTSHOP GRAPHICS, Religion, Appleworks templates, Pascal, Ea-mon, and more). Programs available in 5.25 and 3.5 format. No membership fee! We will beat any price; ask us! BE SURPRISED! Send \$2.00 for a descriptive catalog and demo disk to:

CHRISTELLA ENTERPRISE
P.O. Box 483
St. Clair Shores, Michigan 48080

FREE APPLE PUBLIC DOMAIN CATALOG

Request free catalog containing complete description of hundreds of programs for the Apple II+, e, c, c+, and GS computers. We carry the very best in all categories including Business, Home, Education, Utilities, Games, Print Shop Graphics, Appleworks Templates, and more. We use only high-quality colored disks which are completely SELF-BOOTING and MENU-DRIVEN. All orders are shipped the same day they are received. We pay shipping with small minimum order. Request free catalog or send \$2.00 for catalog and demo disk. Money-Back Guarantee! Send for yours today!

MOONLIGHT SOFTWARE

P.O. Box 179144

San Diego, CA 92177

APPLE PUBLIC DOMAIN

You have found the best source for Public Domain & Shareware for Apple II+, E, C, C+, GS Computers. No minimum purchase. We supply the programs and disk for one low, low price. Some disks have over 40 programs. That's worth repeating, most of our disks have many programs on one disk. Compare our catalog to any other. Our 10th year distributing Public Domain programs. Thousands of programs. Our Big 48 page catalog gives you descriptions of many of the programs, not just a name. Education & School, Games, EAMON, Art & Graphics, Astronomy, Business & Finance, Ham Radio, Math & Statistics, Music & Sound, Appleworks™ templates and more. Send \$3 for Big Descriptive 48 page catalog to:

Computer Budget Shopper (CBS)

2203 Park Ave Suite 25

Cheyenne WY 82007

Use inCider/A+
Classified Section
to showcase your
Products. Contact
Diane Maguire at
1-800-441-4403
for further details.

Computers & Supplies

SUPER DEALS ON MACS & APPLES! BUY** SELL ** TRADE USED ** NEW

Apple IIc	\$325
Apple IIc+	\$425
Apple IIe	from \$299
Apple IIgs	from \$599
All other Apple Systems	CALL
Imagewriter I(Used)	\$269
Imagewriter II(Used)	from \$349
Apple 3.5" Unidisk 800k	\$269
20 MEG External HD (SCSI extra)	\$225
MAC II	from \$2149
MAC IIcx	from \$2399
MAC II ci	from \$3299
All other Mac Systems	CALL
Parts & Peripherals	CALL
Price List	\$.50 SASE
Also open evenings & weekends	

M.P.-Computer Micro Systems
655 W. Evelyn Avenue #2
Mountain View, CA 94041
(415) 968-9026 (VOICE)
(415) 968-0509 (FAX)

FACTORY FRESH RIBBONS

Ribbon	Black	Color
Apple Imagewriter		
I,II	\$ 2.25	\$ 2.95
Imagewriter II		\$ 4.95
4 color		
Imagewriter II		\$ 9.95
4 color Heat transfer		
Imagewriter LQ (Black and 4C)	\$ 8.95	\$13.95
Panasonic 1124	\$ 3.50	
Epson MX/FX/RX80	\$ 2.50	\$ 3.50
Epson MX/FX/RX100	\$ 3.50	\$ 4.00
Star NX1000	\$ 3.25	\$ 3.95

For Orders of less than 6,
please add .75¢ each.

Hundreds more.

Colors (BLUE, RED, GREEN, PURPLE,)

-PREMIUM IS ALL WE SELL!

Shipping/Handling \$3.75 per order
(over \$75 we pay S/H).

AK, HI, P.R., APO/FPO, Canada add
\$6. S/H to all orders

Free box of 10 diskettes with orders over
\$100.00 (specify 5.25 or 3.50). New York
residents please add sales tax.

School, hospital and govt. PO's welcome.

-MONEY BACK GUARANTEE

ISLAND COMPUTER SUPPLY

305 Grand Boulevard
Massapequa Park, New York 11762
(516) 798-6500

!!!REPAIRS BY MAIL !!!

Apple™ computer repairs by trained
service techs at as little as one-half
dealer's pricing, with warranties to one
year.

Apple II+, IIe, IIc Motherboard Swap
\$125.00 plus S&H

5.25" Disk Drive Rehab \$75.00 + S&H

3.5" Disk Drive Rehab \$150.00 + S&H

Mac repairs done as well

Hardware for sale, too much to be list-
ed here. We buy dead hardware.

ARMINIUS PUBLICATIONS & PRODUCTS

8519 Orchard Ave.
Merchantville, NJ 08109
(609) 662 3420

USED SOFTWARE/HARDWARE CLUB

Buy used computer hardware and
software or sell your unneeded
computer hardware and software
(Apple, Atari, Commodore,
Macintosh, PC, etc). We act as
middleman between buyer/seller and
insure honest transactions. We
guarantee that your buys and sells will
be done to your satisfaction. Annual
membership (includes newsletter) is
\$15/year. Use Visa/MC and Call 800-
777-6632 to expedite your
membership. (Call 9-5 Central Time.)
Or send #10 SASE to National Used
Software/Hardware Club for FREE no-
obligation information pack.

NUSHC Dept. I
P.O.Box 1343
Round Rock, TX 78680

Entertainment

HAVE YOU WON THE LOTTERY?

**DO YOU OWN LOTTO PICKER
TM? WELL, WHAT DID YOU
EXPECT! LOTTO PICKER** for
Apple II is a must purchase if you are
SERIOUS about winning larger
jackpots and generating more frequent
smaller winnings on a routine basis!
LOTTO PICKER works by uncovering
hidden biases in your lottery game and
exploiting them in order to provide
you with qualified plays to make. Your
card will be loaded with numbers that
have proven to be statistically
significant for your lottery game.
Works for all lotteries worldwide
(including daily number games). **NEW
LOW PRICE \$29.95 (+\$4.55 s/h)**

SATISFACTION GUARANTEED!

ORDERS: 1-800-484-1062 s-code 0644
or 1-718-317-1961

GE RIDGE SERVICES, INC.
170 Broadway, Suite 201-IC,
New York, N.Y. 10038

inCider/A+

Problems with Advertisers: Send a description of the problem and your
current address to inCider/A+, 80 Elm Street, Peterborough, NH 03458,
attn. Rita Rivard, Customer Service Manager. If urgent, call (800) 441-4403.

Problems with Subscriptions: Send a description of the problem and your current
and/or most recent address to: inCider/A+, Subscription Department, P.O. Box
58618, Boulder, CO 80322-8618. Or call (800) 289-0619, between 9 a.m. and
5 p.m. Mountain time, Monday through Friday. If you have a problem with
payment, please have your mailing label and your canceled check or credit-
card statement in front of you.

Change of Address: Send an old label or a copy of your old address and new
address to: inCider/A+, P.O. Box 58618, Boulder, CO 80322-8618. Please give
eight weeks' advance notice.

Microfilm: This publication is available in microform from University Microfilms
International. United States address: 300 North Zeeb Road, Dept. P.R., Ann
Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London
WC1R4EJ, England. **Dealers:** Contact Linda Ruth, Direct and Newsstand Sales
Manager, inCider/A+, 80 Elm Street, Peterborough, NH 03458. Call (800) 343-
0728.

Back Issues: Send \$4.50, plus \$1.00 postage for each copy to inCider/A+, Back
Issues Dept., 80 Elm Street, Peterborough, NH 03458. For ten or more copies
postage is a blanket \$7.50. To order by telephone using VISA, MasterCard or
American Express call (800) 343-0728, or (603) 924-0100 in New Hampshire.

inCider/A+ magazine is published monthly by A+ Publishing, a division of IDG
Communications. Entire contents copyright 1991, A+ Publishing. No part of this
IDG Communications publication may be reprinted, or reproduced by any
means, without prior written permission from the publisher. All programs are
published for personal use only. All rights reserved.

Designed especially for teachers!

Ten easy-to-use templates from inCider/A+!

Classroom Management Disk for AppleWorks 3.0

Reduce class preparation time! Manage your classroom more
effectively! Make your teaching life more productive with the power
of AppleWorks 3.0 and inCider/A+'s Classroom Management Disk*.
Ease the paperwork crunch for good, and build a convenient data
bank of lessons, tests, reports, grades, statistics, and more!

It features specially designed templates, ready-to-use as they are, or
modify as you choose. Each disk comes with a documentation manual that
will guide you quickly and easily through these useful, convenient
templates:

- Homeroom Database • On-Screen Drill
- Grade Equivalent • Lesson Plan
- Planning Calendar • Letter Form
- Test Bank • Test Construction Kit
- Gradebooks • Quiz Machine

*Requires AppleWorks 3.0. AppleWorks is a registered trademark of
Apple Computer, Inc., licensed to Claris Corporation.

Canadian orders: add 7% GST. Foreign Airmail, add \$3.95.

Foreign orders must be paid in U.S. funds drawn on a U.S. bank.

ONLY \$9.97!

CALL TOLL-FREE 1-800-343-0728(In NH: 924-0100)

inCider/A+Special Products • 80 Elm St • Peterborough, NH 03458

181D

MILESTONES 2000

**Start your engines and hit the race course —
this game gives you more than
one kind of challenge.**

Once in a while, you get to have some fun and do some good, too — dropping a bundle at a charity casino, pigging out on Girl Scout cookies, and now, playing Milestones 2000 on your IIGs. Milestones 2000 is a game that's fun to play, and the \$15 you pay for the pleasure of using it goes to help the homeless. When you pay your shareware fee to Ken Franklin, he passes it along to an organization that helps find homes for people who don't have them.

"You are blessed — you have an address, a roof, and a computer. Please help those who don't," states the game's on-screen message. If shareware rests on a hopeful notion that computer owners aren't bad people, "reliefware," as Franklin calls it, supposes that people are good and want to do good. Would you want to prove him wrong?

The goal of Milestones 2000 is to complete a 5000-kilometer trip by car. You progress by playing mileage cards, which come in denominations of 50, 100, 150, 200, and, for the reckless, 400 kilometers. Each stage of the route must encompass either 1500 or 2000 kilometers exactly.

(Math teachers might note that some calculation is asked of the player if this distance is to come out right.)

The IIGs will try to stop you by playing cards called "Out of Gas," "Crash," and other

predictable road calamities. You impede the computer's progress in the same way, and in order to get rolling again, you (or the computer) need "Gas," "Repair," and other provident cards in your hand (or RAM).

You've probably played a game similar to Milestones; Milles Borne is a classic French card game you play against your friends. In

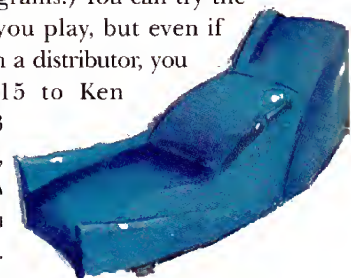
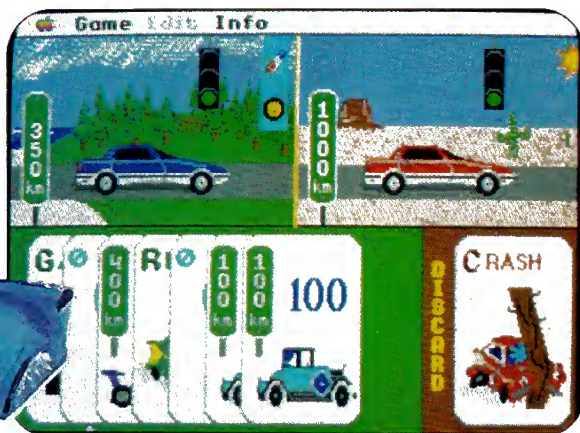
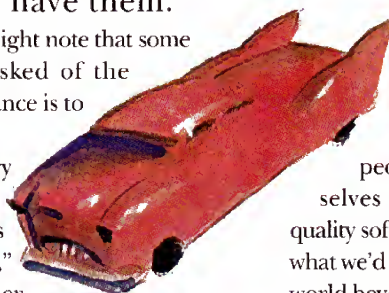
Milestones 2000 you play against the Apple IIGs; your friends will have to watch. The computer doesn't play too well, just well enough to make the game interesting. We developed a winning strategy without any great mental effort after playing a dozen games, but the element of chance keeps it interesting and fresh even when you know you can win consistently.

The sounds are witty — Franklin's kids cheer when you win, and the air whistles merrily when you play a "Flat." And the graphics are disarmingly cute, if not professionally animated multimedia. An accelerator helps — the Zip Chip or TransWarp variety, not the kind you keep your foot on.

Milestones 2000, written by an amateur programmer as shareware in ORCA Pascal, proves what we'd long suspected: The Apple interface and the modular Apple IIGs approach to programming enable people who never thought of themselves as programmers to write high-quality software. Milestones 2000 also proves what we'd hoped: Apple users care about the world beyond their computers.

Milestones 2000 is available where you find good shareware — from on-line networks, at user-group meetings, and from some distributors. (See "Shareware: Bargains You've Never Dreamed Of," June 1991, p. 35, for more information on this and other shareware programs.) You can try the game before you play, but even if you buy it from a distributor, you must send \$15 to Ken Franklin, 5603 81st Street East, Puyallup, WA 98371, if you want to keep it.

EDITORS' CHOICE SINGLES OUT ONE PRODUCT EACH MONTH THAT THE *inCider/A+* EDITORS FEEL IS A SIGNIFICANT ADDITION TO THE APPLE FAMILY. PRODUCTS EVALUATED ARE AMONG THE MOST RECENT RELEASES AND MAY NOT BE AVAILABLE YET FOR RETAIL DISTRIBUTION.



TMS Peripherals

Authorized
Quantum
Dealer

We're not just about great products at great prices, we're about excellent service too!

- Each factory fresh TMS drive is completely tested and verified by our technicians before it is shipped.
- TMS Peripherals' 30 Day Money Back Guarantee: "If you experience a problem with your drive, TMS will ship you a new drive and pick up the suspect drive (at our expense), leaving you with virtually no down time!"
- TMS Peripherals' Full 2 Year Warranty / Toll-Free Tech Support Line—if your problem persists after thorough troubleshooting by our expert technical staff—just ship us the suspect drive and we will send you a replacement unit within 48 hours.
- All Apple drives are preformatted and partitioned and come with the latest System Software & 10+ MB's of shareware. All Macintosh drives are preformatted and come with the latest System Software, 19+ MB's of BMUG shareware and DISK DOUBLER by Salient Software. DISK DOUBLER was rated 4 1/2 Mice as the 1990 MacUser Editor's Choice Award for Best Compression Product and doubles your Mac disk drive capacity easily and safely!
- Of course, each drive also comes with our enthusiasm for each of our products! For your convenience, we're open 8am-10pm (EST) 7 days a week and all products ship Federal Express. C.O.D.'s and P.O.'s accepted.

*All prices subject to change.

OUR CUSTOMERS HAVE THE LAST WORD...

Great service—this is the first company to deliver on time. I was amazed."

—Mike Wyatt

"I love the drive. Delivery and service are impressive. I had the equipment 26 hours after I ordered it. Thanks!"

—Mike Seaton

"...they absolutely excel in having the best technical service that I have ever encountered."

—Webster W. Plourde
Col. USAF (Ret.)

"If you need a hard drive, I highly recommend that you buy it from TMS. I was impressed with TMS' products and service...they truly deserve your business."

—Steven W. Disbrow
GS+ Magazine

FREE
OVERNIGHT SHIPPING
PLEASE CALL FOR DETAILS!

1.800.626.MEGS

1120 Holland Dr., Suite 16
Boca Raton, Florida 33487
Internat'l. 407.998.9928
FAX: 407.998.9983



VITESSE

"Setting a new standard in utilities for the Apple market." InCider A+ '91

SALVATION SUPREME

Buy ALL 5 Salvation Utilities for the IIs. \$99

Salvation Utilities

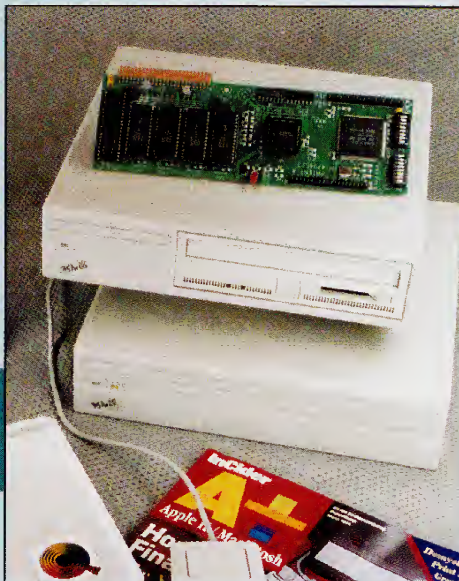
This is the complete utilities series for IIs users. Includes virus detection & cure, backup utility, hard disk optimizer, manager, and file repair & recovery.

Bakkup, Renaissance, or Deliverance \$28

Exorciser \$27

Wings \$46

Quickie \$195



QUANTUM STORAGE SUBSYSTEMS

TMS PRO SERIES DRIVES

	Int.	Ext.	
Pro 52 LPS	\$249	\$349	11ms
Pro 105 LPS	459	559	11ms
Pro 105	399	499	12ms
Pro 120	659	759	10ms
Pro 170	729	829	10ms
Pro 210	799	899	10ms

SYQUEST REMOVABLE SUBSYSTEMS

TMS Pro R45, \$489 • 20ms • extra carts \$68
TMS Pro R88, \$1314 • 20ms • extra carts \$140

TAPE BACKUP SYSTEMS

Tape is fast, inexpensive & has a high storage capacity!

TMS Pro T60, \$439 • TMS Pro T155, \$499

CHINON

TMS CD ROM, 350ms, only \$579

PRO SERIES STANDARD FEATURES

- Internat'l. Auto-Switch Power Supply
- Selectable Pushbutton SCSI ID Switch
- 2 SCSI Ports (allowing daisy chaining)
- 2 A/C Jacks / Shielded Power Supply
- VCA Mechanism / 19+ MBs Shareware
- ALL necessary hardware / manuals

C.V. TECHNOLOGIES

INTRODUCING RamFAST/SCSI V2.00!
THE FASTEST HARD DRIVE CONTROLLER FOR THE IIs IS NOW EVEN BETTER!

- RamFAST / SCSI supports MORE devices than Apple!
- Improved support for Removables & CD-ROMs
- Tape backup software runs in the background mode
- New mouse driven configuration program
- Supports up to 12 partitions even under ProDOS 8
- Boot ANY partition / password protection
- Automatic lookahead for unbeaten performance
- Defect management for the ultimate in data integrity
- Only \$189 or \$179 with the purchase of any drive!

C.V. TECH MEMORY BOARDS

0, 1, 2, 3, & 4 MB GS-Memory Boards

\$79, \$142, \$194, \$246, & \$299

RAM Chips: 256k 100ns (set of 8), \$18

1MB 100ns (set of 8), \$66

WESTCODE

InWords—scans up to 500 wds (3000 characters) per min. when used with Quickie scanner \$77

APPLE SOFTWARE

Apple Works 3.0 \$165
Apple Works GS 1.1 \$195

ZIP™ TECHNOLOGY

ZIPGSX, Model 1500, 7 MHz/8k Cache memory, \$149

ZIPGSX, Model 1600, 8 MHz/16k Cache memory, DMA Compatible, \$199

ZIPGSX, Model 1800, 9 MHz/32k Cache memory, DMA Compatible, \$249

Æ APPLIED ENGINEERING

Æ PC Transporter 768k	\$249
Æ 3.5"	\$195
Æ 3.5" HD	\$235
Æ DataLink 2400 Internal	\$159
Æ DataLink 2400 External	\$159
Æ DataLink 2400 MNP5	\$189
Æ DataLink 2400 MNP5/send-FAX	\$215
Æ ReadyLink	\$57
Æ Conserver	\$77
Æ Power Supply Iie	\$78
Æ Power Supply GS	\$85
Æ PC Transporter	\$259
Æ PC Transporter GS Kit	\$36

MACINTOSH SYSTEMS

Macintosh IIsi 3/40 • 12" RGB Monitor & Keyboard, \$3429

Macintosh IIsi 3/40 • 13" RGB Monitor & Ext. Keyboard, \$3869

Macintosh LC 2/40 • 12" RGB Monitor & Keyboard, \$2549

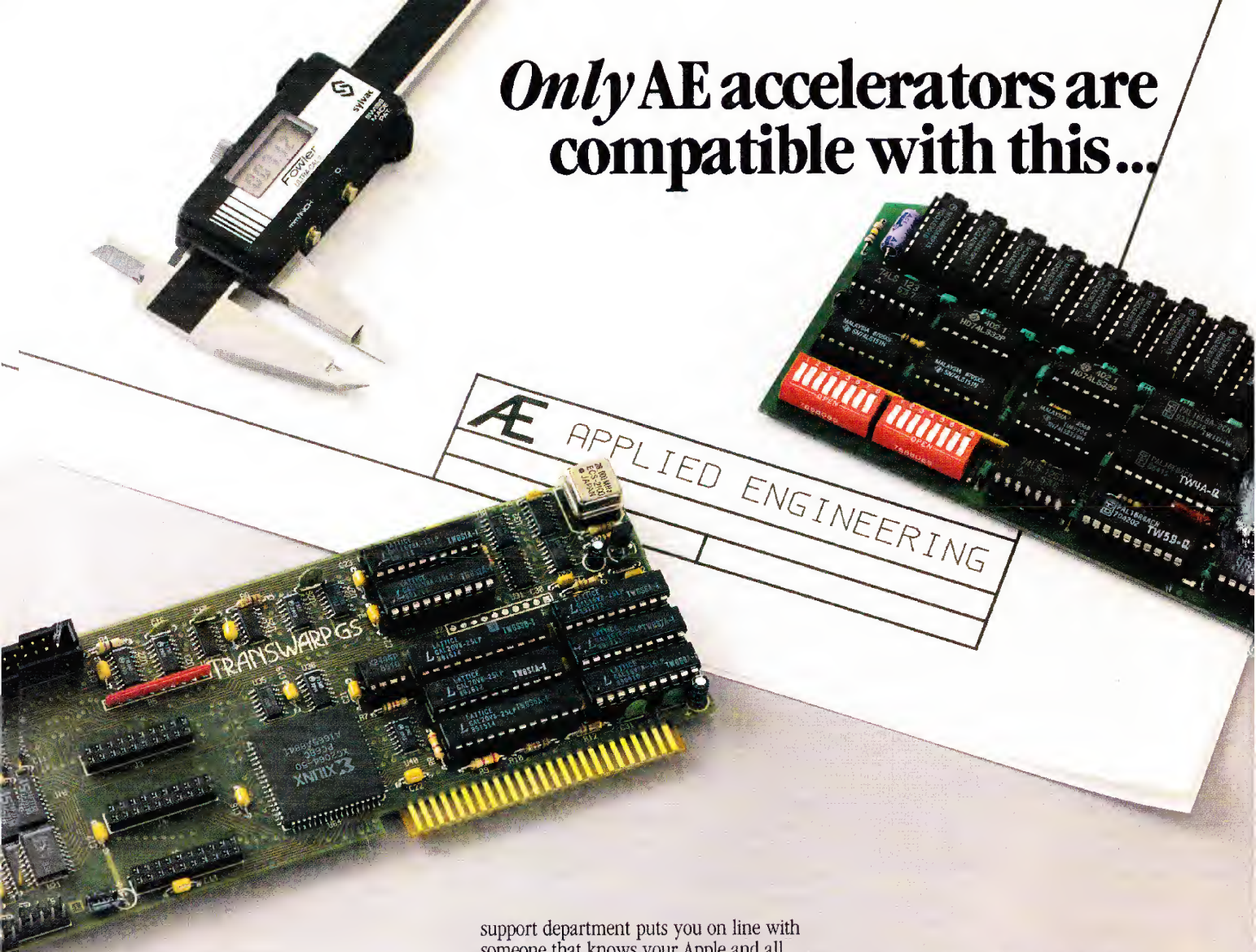
Macintosh IIsi 5/0 • 13" RGB Monitor & Ext. Keyboard, \$4899

Mac Classic, \$920

Personal LS, \$1049

StyleWriter, \$459

Only AE accelerators are compatible with this...



A blank sheet of engineering paper.

For some time now, we've done all of our design work using CAD (computer aided design), but the blank sheet of paper shown above represents future AE peripherals and accessories for the Apple II line.

Because accelerator cards push technology close to the limit, designing new peripheral cards to be fully compatible with a given accelerator requires a special insight. That's why whenever one of our engineering teams designs an Apple II peripheral, they have to take into account the way in which TransWarp™ and TransWarp GS™ will interact with that particular peripheral device.

Both TransWarp and TransWarp GS were designed with future upgrades in mind (note the 40-pin high speed Bus connector on TransWarp GS). That's why Apple owners who expand and enhance their computers with Applied Engineering products have far fewer compatibility and performance problems than those who try to "mix and match". But should you ever have a question, one call to our technical

support department puts you on line with someone that knows your Apple and all the peripherals in it, making a solution to your configuration much easier.

You've probably already read the great reviews the TransWarps have received; *"I wasn't able to find a single piece of software incompatible with it, nor could I attribute any system problems to the card's presence."* - A+ (IIGS)

"TransWarp is great. I have replaced all my other accelerators with it!" - Steve Wozniak, co-founder of Apple (IIe).

"Wait til you see it perform. Folders and icons open from the finder like lightning text wraps instantly around graphics in your favorite desktop publishing program; documents scroll at a reasonable rate in any graphics-based word processor. TransWarp makes the GS as good as the Mac, because it's fast and it's still in color." - Incider (IIGS)

"Your engineering department should take a bow. As a developer and consultant, I work with the Mac II and Mac SE as well as the IIGS. I have conducted some recent tests which indicate that the "little" IIGS outperforms the Mac SE." - George Dombrowski, Jr. (IIGS)

Both cards offer "plug in and go" performance. No preboot disks or complicated configurations necessary. And should you wish it to, your Apple can still run at normal speed by a simple keyboard command. So, if you'll remember us when you decide to make your Apple II run faster, we'll remember you every time we get out another blank sheet of paper.

TransWarp GS Accelerator.....\$349
TransWarp II+, IIe Accelerator...\$119

Order Today! To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days. Or send check or money order to Applied Engineering. MasterCard, VISA and C.O.D. welcome. Texas residents add applicable sales tax.

AE Applied Engineering®
The enhancement experts.

A Division of AE Research Corporation

(214) 241-6060

P.O. Box 5100
Carrollton, TX 75011

Made
in the
USA

©1990 AE Research, Inc. All rights reserved. Prices subject to change without notice. Brand and product names are registered trademarks of their respective holders.